BULLETIN OF MISCELLANEOUS INFORMATION No. 3 1934
ROYAL BOTANIC GARDENS, KEW

X—NOTES ON ORTHOTHYLAX.

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Some time ago I revised the *Philydraceae* in the Berlin Herbarium and found that *Helmholtzia glaberrima*, described by J. D. Hooker under *Philydrum* (Bot. Mag. **99**, t. 6056 : 1873) and later transferred to *Helmholtzia* by Bentham in Fl. Austral. 7 (1878) and by Caruel in DeCandolle, Mon. Phan. **3** (1881), ought to form a separate genus, for which I used J. D. Hooker's section name *Orthothylax* (see Engler's Jahrb. **66**, 261–265, figs. 29–48). My material consisted of cultivated plants exactly matching those used by J. D. Hooker for his description and plate. Regarding the home of *Orthothylax* I had only Bailey's statement (Queensland Flora, 1646 : 1902) that it had been found " in Southern localities," but there did not seem to exist any material from Queensland in European collections.

Taking up the matter again lately I was able, by courtesy of the Director, to examine the specimens in the Kew Herbarium. Besides two cultivated specimens there is one from Queensland (*Hubbard* 4276. " Moreton District, Macpherson Range, Springbrook, on bank of stream in rain forest on brown loam, 29.9.1930 ") ; and three from New South Wales, two fine flowering and fruiting inflorescences labelled " Tumbulgum W. B. Jan. 1897 " and communicated by Mr. R. T. Baker, Technological Museum, Sydney (Mr. Summerhayes suggests that " W. B." means W. Bauerlen), and one fruiting panicle labelled " Nightcab [-cap ?] Mt., Tweed, de la Camara 1882," sent by F. von Mueller. Both the last-mentioned places are in the extreme N.E. corner of New South Wales, not far from the Queensland border and probably not far from each other, for Tumbulgum is situated on the river Tweed. In the local Floras the species is stated to occur on the upper Richmond River which is just to the west of the other localities. The Macpherson Range forms the boundary between Queensland and New South Wales.

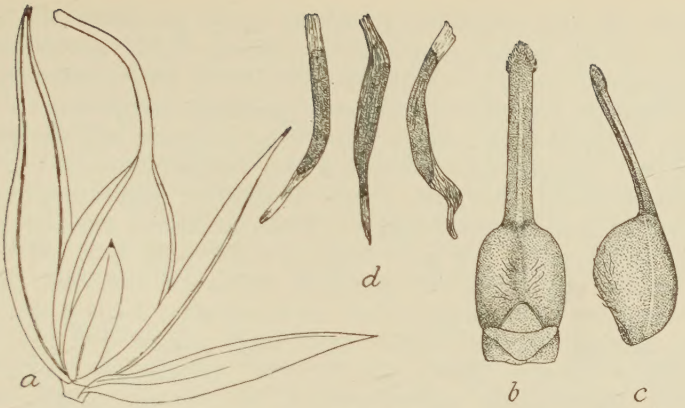
The cultivated plants in the Kew Herbarium agree in every detail with the Berlin specimens. To my description I should add that the bract is adnate to the flower axis and that the very base of the filament is concrescent with the anterior tepal. The Springbrook specimen is very robust. The single leaf present measures 118 cm. in length (a few centimetres at the base missing) and 4 cm. in width. The difference in colour between the two surfaces is obvious. The scape + panicle is 79 cm. long and must have been over 80, as the lowermost part is missing ; the distance from the base to the lowest branch-bearing spathe is at least 28 cm. The trigonous scape is

6–7 mm. thick, or perhaps more. The length of the floral branches of the 1st order is up to 19 cm.—that of the 2nd order up to 7 cm., but the panicle is not fully developed and only a few flowers are expanded. The tepals differ slightly in shape and size from those examined before (see table). The Tumbulgum plant is less robust yet still larger than the cultivated specimens examined before ; its panicle is fully 40 cm. long, the branches of the 1st order as much as 20, those of the 2nd and 3rd about 10 and 4 cm. respectively. The conspicuously trigonous scape is at least 5 mm. thick and bears a few long, fugaceous hairs. In flower size Baker's specimens fall between the cultivated ones and *Hubbard* 4276 (see table below).

All measurements in millimetres.

	Cult.	*Baker.*	*Id. in fruit.*	*Hubbard.*
Bract:	3·7—6·5 × 1·6—3·0	4·1—7·0 × 1·2—2·0	8 × 2·8	6·8 × 1·5—2·8
Tepals:				
posterior ...	5·1—9·0 × 2·5—3·5	6·0—9·5 × 1·9—3·0	10 × 4	10—11 × 3—3·5
anterior ...	4·0—7·5 × 2·1—3·4	5·2—8·0 × 1·2—2·8	9·5 × 3·3	7·5—9 × 3·0—3·9
lateral ...	2·0—3·5 × 1·3—2·5	2·2—4·2 × 0·8—1·7	4·5 × 1·9	4·5—5 × 2·0—2·2
Stamen:				
filament ...	1·0—2·6	1·0—1·1		1·3—1·4
anther ...	2·2—3·3	2·0—2·4		2·5—2·6
Pistil:				
ovary ...	1·7—2·6 × 1·4—2·0	1·3—2·7 × 1·0—1·8		2·0—2·1 × 1·6—1·7
style	3·0—4·3	3·1—4·5		5·3—5·5

Fig. a (Tumbulgum), compared with the figures I have published before, shows these differences. One of the important characteristics of *Orthothylax* is the zygomorphic pistil (figs. b, c). These figures were drawn from a cultivated specimen (J. D. Hooker's type). The ovary is quite glabrous in the Australian specimens seen. Ripe fruit is plentiful in the plants from New South Wales. The capsule splits like that of *Philydrum*. It is trigonous, with flat sides, glabrous, and measures 6·5–7·5 × 3–4 mm. The seeds are of the same general shape as in *Helmholtzia*, but considerably longer and narrower, about 3 mm. long including the funicle, and 0·20–0·25 mm. wide. The surface layer of the testa is hyaline and produced at both ends (fig. d).



Orthothylax glaberrimus. a, Flower with young capsule (× 5). b, c, pistil of a young flower, ventral and lateral views (× 17). d, seeds (× 10).

Orthothylax is an interesting local endemic. It differs from *Helmholtzia* in the free perianth segments, the zygomorphic pistil, partly unilocular ovary, and dry, loculicidally dehiscent capsule. *Helmholtzia* has a conspicuous perianth tube, lateral tepals united with the filament for half their length, actinomorphic pistil, and completely trilocular ovary ; the leathery pericarp does not seem to split, and there is no sign of the lines of dehiscence so conspicuous in *Orthothylax* (figs. a, c).

XI—DECADES KEWENSES Plantarum Novarum in Herbario Horti Regii Conservatarum. DECAS CXXX.

1291. **Hoffmanseggia miranda** *Sandwith* [Leguminosae-Eucaesalpinieae] ; species foliolis prominenter venosis, forma stipularum bractearumque fimbriato-glandulosa, praecipue processibus petalorum insignibus quam in ceteris speciebus multo longioribus eglandulosis distinctissima.

Fruticulus humilis, ramis vetustis lignosis glabris apice ramulis coronatis ; ramuli summi annotini graciles, haud conspicue angulati, vulgo brunnescentes, plus minusve incano-pubescentes glandulis stipitatis raris interspersis ; ramuli novelli foliati breves, incano-pilosuli atque glandulis stipitatis numerosis praediti. *Stipulae* lanceolato-subulatae, dorso costatae, pilosulae, 3–5 mm. longae, circiter 1·3 mm. latae, apice marginibusque glandulis longe stipitatis insigniter fimbriatae. *Folia* passim incano-pilosa, petiolo insuper saepe glandulis stipitatis hic illic praedito ; petiolus 2–4 cm. longus ; pinnae imparipinnatae, 3–5-jugae (vulgo 4-jugae), divaricatae, saepius 1–1·7 cm. longae, internodiis rhacheos 3·5–10 mm. longis, pinna terminali adjecta ad 2·2 cm. longa ; foliola paripinnata, 3–5-juga, subsessilia petiolulis brevissimis, oblonga vel obovato-oblonga, apice late rotundata, basi obliqua rotundata brevissime cordata, 2–6·5 mm. longa, 1·5–4 mm. lata, rigida, fere subcoriacea,

utrinque pilosula, eglandulosa, subtus saepe glaucescentia, palmatinervia, nervis utrinque praesertim subtus valde prominentibus. *Inflorescentia* racemosa, terminalis, 5·5–14 cm. longa, pilosula atque dense stipitato-glutinoso-glandulosa, glandulis atropurpureis ; pars florifera vulgo 2–6 cm. longa ; bracteae insignes, stipulis perfecte similes, sed angustiores, circiter 4–5 mm. longae, caducae ; pedicelli flexuoso-recurvati, 3–4 mm. longi, densissime stipitato-glandulosi. *Calycis* lobi lanceolato-oblongi vel lobus maximus ovato-oblongus, obtusi, subaequales, 6–8 mm. longi, 1·6–3·8 mm. lati, extra pilosi atque longe ciliati necnon glandulis stipitatis hic illic praediti. *Petala* siccitate flava usque rubra, fere aequalia, 1·1–1·3 cm. longa, glabra, lamina obovata 5–6·5 mm. lata, ungue 3–6 mm. longo marginibus superne (laminaque inferne) processibus filiformibus tenuibus eglandulosis nigrescentibus ad 2 mm. longis ornato. *Stamina* 10, ad 1·2 cm. longa, filamentis inferne dilatatis trientibus duobus inferioribus praesertim prope basim conspicue pilosulis eglandulosis apicem versus glabris ; antherae oblongae, 1·3 mm. longae, 1 mm. latae. *Ovarium* sessile, glabrum, lineari-oblongum, 2·5–3 mm. longum, 0·7 mm. latum ; stylus glaber, 6–11 mm. longus ; ovula in ovario unico dissecto 6. *Legumen* immaturum tantum visum, divaricato-subfalcatum, dense tomentosum, 1 cm. longum, 2 mm. latum, glandulis nullis obviis.

PERU. Dept. Arequipa ; Mollendo, sea-level to 170 m., August 1932, *D. Stafford* no. K.53 (type).

1292. **Gochnatia arequipensis** *Sandwith* [Compositae-Mutisieae] ; *G. bolivianae* Blake atque *G. curviflorae* (Griseb.) O. Hoffm. affinis, ab ambabus foliis parvis, praeterea ab illa capitulis paucifloris tubo corollae longiore sed lobis brevioribus, ab hac involucri bracteis extra haud incano-tomentosis angustioribus intimis oblanceolato-linearibus attenuato-acutis differt.

Frutex inermis, ramis intricatis nodosis tomentosis, vetustis nigrescentibus demum glabrescentibus ; ramuli laterales in globos lanatos apice foliatos insigniter redacti ; globi demum in ramulos novellos hornotinos incano-tomentosos elongati ; internodia saepius 0·7–1·5 cm. longa. *Folia* in ramulis hornotinis vel alterna vel apice ramulorum novellorum axillarium globosorum conferta, ovata usque elliptica vel oblonga vel etiam obovata, apice acuta vel obtusa, vix mucronulata, basi cuneata usque (in majoribus) obtusa vel rotundata, 0·5–1·8 cm. longa, 0·25–1·2 cm. lata, firme chartacea vel subcoriacea, integra vel raro obscure sinuato-crenulata, juventute utrinque incano-tomentosa, senectute supra pubescentia tantum sed glandulis sessilibus punctata, plus minusve quintuplinervia, nervis primariis vel lateralibus utrinque praesertim subtus prominentibus, supra cum venulis senectute prominulo-reticulatis ; petioli incano-tomentosi, 1–4 mm. longi. *Capitula* axillaria et terminalia, solitaria sed saepe (in planta Lechleriana) apice ramulorum 2–3 aggregata, sessilia, discoidea, 10–12-flora tantum, adulta 1·2–2 cm. longa, infundibuliformia. *Involucrum* pluri- (circiter 7) seriatum, 1–1·5 cm. longum ;

bracteae exteriores ovatae, acuminatae, marginibus ac apice ciliatis sublanatisque ceterum glabrescentes vel glabrae, sensim in intimas oblanceolato-lineares vulgo 1–1·3 cm. longas, 1–1·2 mm. latas apice conspicue attenuato-acuminatas omnino glabras sed glandulis sessilibus praeditas transeuntes. *Corolla* flava, glabra, circiter 1·3 cm. longa ; tubus 8·5–9 mm. longus ; lobi aequales, 4–4·5 mm. longi, versus apicem valde revoluti. *Antherae* 4·5 mm. longae ; caudae ciliatae, 2·2 mm. longae. *Stylus* 1·3–1·5 cm. longus, ramis erectis 0·8–1·2 mm. longis. *Achaenia* 5 mm. longa, dense sericeo-pilosa ; pappus 10–11 mm. longus, paleis sordide albis prorsus hispidulis.

PERU. Volcán de Arequipa, in collibus aridis, Sept. 1854, *Lechler* 2751 (typus in Herb. Kew.). Arequipa, 2500–3300 m., fl. Aug.–Sept. 1932, *D. Stafford* no. D.44 : " flowers just after the rain in dry sand."

Miss Stafford's plant differs from Lechler's in having the heads solitary instead of 2–3 together at the apex of the branchlets, and in certain small differences of measurement which seem of little importance, at any rate in the absence of further material collected at all stages and seasons.

1293. **Lobostemon inconspicuus** *Levyns* [Boraginaceae] ; affinis *L. capitato* Buek, habitu minore, foliis minoribus et angustioribus supra glabris vel fere glabris differt.

Suffrutex usque 20 cm. altus, satis ramosus ; rami pilis brevibus numerosis et setosis paucis induti. *Folia* patentia, linearia, 8–18 mm. longa, circiter 2 mm. lata, supra leviter canaliculata, glabra vel setis paucis, infra et margine setis rigidis armata. *Inflorescentia* cymarum compactarum plurium composita ; bracteae foliis similes sed minores. *Calyx* corollae tubi parte attenuata aequilongus vel paulo longior ; sepala aequalia vel subaequalia, linearia, extra setis tenuibus et crassis intermixtis induta. *Corolla* odorifera, tubo angusto cylindrico longitudine tota dimidio breviore, regularis, circiter 6 mm. longa, extra glabra, alba, lobis oblongis demum marginibus brunneis. *Squamae* prope tubi apicem insertae, faucem fere claudentes, obtuse triangulares, lobis lateralibus conspicuis. *Stamina* aequalia vel fere aequalia, exserta, supra insertionem squamarum leviter adnata. *Stylus* glaber. *Fructus* non visus.

SOUTH AFRICA. Bredasdorp Div. ; flats between Elim and Bredasdorp, in sandy places, 30 m. alt., Sept.–Oct., 1933, *Levyns* 4524.

1294. **Martinella insculpta** *Sprague et Sandwith* [Bignoniaceae] ; a *M. obovata* (H. B. K.) Bur. et K. Schum. foliolis basi haud cordatis rete venularum utrinque insculpto, rhachi inflorescentiae brevi incrassata deflexa internodiis brevioribus, calyce crassiore recedit.

Frutex scandens ; ramuli annotini teretes vel tetragoni, nigrescentes, striati, glabri, nodis inter bases foliorum consociebus glandularum ellipticarum immersarum ornatis, glandulis pro rata

paucis magnis. *Pseudostipulae* minutae. *Folia* bifoliolata cirrho trifido vel simplici (an vere?) ; petioli 1·5–5 cm. longi, ut petioluli glabrati ; foliola ovata usque elliptica vel lanceolato-elliptica, plerumque conspicue acute acuminata, basi rotundata vel obtusa vel cuneata, 6–17·5 cm. longa, 2·5–8 cm. lata, coriacea, glabra, utrinque rugosula, nervis lateralibus arcuato-ascendentibus utrinsecus 5–7 supra ut costa impressis subtus leviter elevatis, rete venularum utrinque impresso. *Racemi* breves, singuli vel bini pro axilla ; rhachis usque 6 cm. longa, decurva, demum incrassata, glandulis magnis impressis ornata, juventute minute puberula, floribus crebre dispositis internodiis 3–5 mm. longis ; bracteae late subulatae, sursum curvatae, paullo ultra 1 mm. longae ; pedicelli 0·5–1 cm. longi. *Calyx* tubuloso-campanulatus, circiter 1·5–2 cm. longus, crassiusculus, glaber, glandulis paucis impressis, siccitate nigrescens, irregulariter 2–3-lobatus, lobis usque 6 mm. longis mucronatis. *Corolla* campanulato-infundibularis, rosea, prorsum curvata, 5–6 cm. longa, limbo 3–4 cm. diametro siccitate nigro-purpurascente, tubo extra glabro (statu vivo albo), limbo utrinque praesertim intus puberulo, intus infra bases filamentorum cingulo vix 1 cm. lato breviter villoso ornata. *Filamenta* circiter 1·7–1·8 cm. supra basin inserta ; thecae divaricatae, elliptico-oblongae, 4–4·5 mm. longae. *Discus* patelliformis. *Ovarium* oblongum, inferne ovoideo-incrassatum, basi ipsa in discum dilatatum, 4 mm. longum, minutissime sparse lepidotum ; stylus inferne dilatatus, glaber ; ovula pro loculo numerosa, 4-seriata. *Fructus* ignotus.

British Guiana. Without locality, *Drake* (type in Kew Herb.). Essequibo and Rupununi Rivers, *Rob. Schomburgk* (Kew Herb.). Without locality, *Anna H. Taylor* (New York Bot. Gard.). Akarabice Creek, Cuyuni River, fl. July, *Tutin* 424 (Brit. Mus. ; Kew Herb.) ; corolla tube white, limb magenta.

Venezuela. San Carlos, Rio Negro, *Spruce*, sine numero (Kew Herb.).

Spruce's specimen, being sterile, cannot be assigned with complete certainty to *M. insculpta*.

1295. **Pleonotoma echitidea** *Sprague et Sandwith* [Bignoniaceae] ; *P. chondrogonae* (Miq.) Miers affinis, indumento ramulorum ac inflorescentiae, forma calycis longioris, ovario styloque pubescente, praesertim corolla hypocrateriformi differt.

Frutex scandens ; ramuli generis typici, satis dense minute albo-furfuraceo-lepidoti atque pubescentes. *Pseudostipulae* spathulatae, circiter 5–6 mm. longae, lamina 2–3·5 mm. lata supra dense minute pubescente subtus nervosa glabrata sed glandulis patelliformibus immersis praedita. *Folia* varie bipinnato- vel tripinnato-ternata ; cirrhus non visus ; petiolus indumento ramulorum, vulgo 2–5 cm. longus ; internodia rhacheos petiolulique similiter induti, petioluli 2–8 mm. longi ; foliola ovata vel ovato-oblonga, apice breviter saepe obtuse acuminata, basi obliqua rotundata vel obtusa, vel superiora atque terminalia pinnae cuiusque basi cuneata, 1·5–8·5 cm.

longa, 0·8–5 cm. lata, adulta chartacea vel subcoriacea, supra nitida, glabra vel costa subtus minute puberula, epunctata, utrinque valde intricate reticulata, nervis lateralibus 6–8 subhorizontalibus vel plus minusve ascendentibus primo rectis tum laete arcuato-anastomosantibus. *Inflorescentiae* racemosae, apice ramulorum vulgo 3, quarum media terminalis, duae laterales ex axillis foliorum summorum exsurgunt, 2–12 cm. longae, dimidio inferiore vulgo nudae, superiore corymbiformes, ubique dense minute pubescentes necnon lepidotae; bracteae anguste ovato-lanceolatae usque lineari-lanceolatae, circiter 1·5–2·5 cm. longae; bracteolae basi pedicellorum positae, bracteis breviores ac angustiores; pedicelli inferiores usque 1·8 cm. longi, superiores sensim breviores. *Calyx* tubulari-campanulatus, 5–7 mm. longus, 3–4 mm. latus, apice truncatus minute denticulatus, costis de dentibus per calycem decurrentibus, extra dense minute pubescens, infra apicem seriebus glandularum immersarum patelliformium juxta costas notatus. *Corolla* teste lectore purpurea, hypocrateriformis; tubus perangustus, 2·5–3·2 cm. longus, versus apicem sensim ad 3·5–5·5 mm. latitudinis tantum ampliatus, extra dimidio superiore dense cinereo-furfuraceo-pubescens et glandulis brunneis sessilibus praeditus, inferne glaber, intus infra staminum insertionem aliquantum glandulosus atque lepidotus; limbus circiter 3–4·5 cm. diametro, lobis inaequalibus ut videtur 1·3–2 cm. longis ad 1·2 cm. latis, utrinque dense furfuraceo-pubescentibus et conspicue brunneo-glandulosis praeterea sparse albo-lepidotis et dimidio inferiore extra glandulis patelliformibus immersis praeditis. *Stamina* dimidio superiore corollae tubi inserta, filamentis glabris 8–9 mm. longis; antherae infra faucem absconditae, thecis divergentibus 3·75 mm. longis, connectivo vix producto. *Discus* pulvinari-cupularis, 1·3 mm. altus. *Ovarium* lineari-oblongum, circiter 4 mm. longum, dense pubescens; stylus ubique praesertim inferne pubescens; ovula biseriata, in quaque serie circiter 14–16. *Capsula* linearis, in rostrum breve attenuata, circiter 36 cm. longa, 1 cm. lata, obscure lepidota, hic illic glandulis parvis patelliformibus immersis praedita. *Semina* anguste transverse oblonga, 6–8 mm. longa, 2·8–4 cm. lata, alis membranaceis latis velut nucleo brunneis.

British Guiana. Upper Demerara River, fl. Sept. 1887, *Jenman* 4124 (type in Kew Herb.); a bush-rope. Amakura River, North-west District, fl. March 1923, *Cruz* 3483 (New York); climbing 12 ft., fl. purple. Without locality, *Abraham* 262 (type of fruit, New York).

1296. **Pleonotoma pavettiflora** *Sandwith* [Bignoniaceae]; *P. echitideae* Sprague et Sandwith forma foliolorum necnon corollae affinis, sed foliolis utrinque conspicue punctatis, corolla parva multo minore, calycibus alabastris totis tuboque maturo oculo nudo glabris, antheris e fauce protrudentibus, ovario lepidoto, stylo glabro differt.

Frutex scandens; ramuli generis typici, indumento eorum *P. echitideae*. *Pseudostipulae* spathulatae, apice nonnunquam breviter

acuminatae, 4–5 mm. longae, lamina ad 2 mm. lata, ceterum ut in *P. echitidea*. *Folia* vulgo 9–17 cm. longa, simpliciter imparipinnata 5-foliolata, vel biternata cum cirrho gracili tenui apice trifurcato terminata ; petiolus indumento ramulorum, 1·5–3·5 cm. longus ; petioluli similiter induti, 3–7 mm. longi ; foliola ovata vel oblonga, terminalia nonnunquam obovato-oblonga, apice breviter obtuse acuminata vel cuspidata, inferiora basi rotundato-obtusa et abrupte in petiolulum contracta, superiora et minora basi cuneata, haud vel raro obliqua, 3·5–9·7 cm. longa, 1·4–4·7 cm. lata, coriacea, supra nitida, costa minute puberula ceterum glabra sed conspicue punctata, subtus costa nervisque minute pubescentibus atque lepidotis, pagina ubique dense minutissime lepidota atque minus dense sed conspicue punctata, supra intricate subtus laxius sed prominentius reticulata, nervis lateralibus 7–8 ascendentibus ac arcuato-anastomosantibus. *Inflorescentiae* ut videtur axillares et terminales, racemosae, floribus nonnunquam apice congesto-corymbosis, 4–9 cm. longae, glabratae sed sparse lepidotae ; bracteae ovatae, pubescenti-ciliatae, circiter 0·75–1·2 mm. longae, ad 0·75 mm. latae ; bracteolae basi pedicellorum similes sed minores ; pedicelli subvernicoso-nitiduli, glabri sed sparse lepidoti, imi ad 1·5 cm. longi, superiores sensim breviores. *Calyx* tubulari-campanulatus, 3·5–5 mm. longus, post florem lapsum vix ad 4 mm. latus, apice truncatus ciliolatus vix denticulatus, extra subvernicoso-nitidulus rugulosus, glaber vel sparse lepidotus, infra apicem seriebus glandularum immersarum patelliformium praeditus. *Corolla* teste lectore alba, odorem *Jasmini* specierum proprium reddens, hypocrateriformis, parva ; tubus perangustus, 1·6 cm. longus vel brevior, apice vix ampliatus, extra glaber vel sparsissime obscure lepidotus ; limbus 1·3 cm. tantum diametro, lobis ad 7 mm. longis ad 3·2 mm. latis maturis sub lente forti utrinque dense glandulosis atque sparsius lepidotis. *Stamina* 4·5 mm. supra tubi basin inserta, filamentis glabris in unico flore immaturo dissecto 5 mm. longis ; antherae e fauce corollae protrudentes, thecis divergentibus vix 2 mm. excedentibus, connectivo conspicue ad 0·75 mm. producto. *Discus* pulvinaris, 1 mm. altus. *Ovarium* linearioblongum, circiter 2 mm. longum, minute lepidotum ; stylus glaber, in flore nondum expanso 3 mm. longus ; ovula biseriata. *Capsula* (vix matura) linearis, apice breviter attenuata obtusa, 21 cm. longa, 1 cm. lata, lepidota.

Brazil. Matto Grosso : at the edge of forest, Burity, N.E. of Cuyaba, 2250 ft., June 1927, *Miss Gwen Dorrien Smith* 294 (type in Kew Herb.) : " a vigorous climber ; fl. white, with scent of jasmine."

This species is immediately distinguished from all other tropical American *Bignoniaceae* by the combination of the branchlets and leaves characteristic of the genus *Pleonotoma* with peculiarly small hypocrateriform corollas.

1297. **Protea stipitata** *Phillips* [Proteaceae] ; affinis *P. rhodanthae* Hook. f. sed foliis et capitulis majoribus, involucri bracteis numerosioribus inferne dense et molliter tomentosis differt.

Rami glabri. *Folia* 9·5–20 cm. longa, 2·7–4·3 cm. lata, lanceolata, apice obtusa, basi angustata, plus minusve distincte venosa. *Capitula* solitaria vel apice ramorum conferta, pedunculata, 6–7 cm. longa ; pedunculus circiter 1 cm. longus. *Receptaculum* convexum. *Involucri bracteae* 12–13-seriatae ; exteriores ovatae, apice obtusae, inferne molliter tomentosae ; interiores oblongae, calyce subaequales. *Calycis tubus* 3·2 cm. longus, membranaceus, basi dilatatus, 7-nervosus, nervis 3 prominentibus, intus dense pilosus ; laminae 1·4 cm. longae, subpilosae ; laminae connatae apice tridentatae, ciliatae. *Stamina* 9·5 mm. longa, linearia, apice glandibus ovatis instructa. *Ovarium* 3·5 mm. longum, pilis longis vestitum ; stylus 4 cm. longus, glaber ; stigma 1 cm. longum.

South Africa. Transvaal : Pietersburg distr. ; Farm " Mountain Home," 45 miles east of Pietersburg, on the steep grassy slopes of mountains, *Murray in National Herbarium* 14510.

1298. **Epidendrum** (**§ Amphiglottium**) **Hombersleyi** *Summerhayes* [*Orchidaceae*] ; affine *E. orchidifloro* Salzm. et *E. smaragdino* Lindl., a quibus labello obovato integro facile distinguendum.

Caules erecti e basi breviter repente radicante, radicibus flexuosis glabris, fere usque apicem foliati, circiter 30 cm. alti, 2–3 mm. diametro, basi cataphyllis paucis membranaceis vaginantibus obtecti. *Folia* e basi valde striata arcte vaginante exorientia, lanceolata vel elliptico-lanceolata, acuta, 2·5–8 cm. longa, 6–16 mm. lata, carnosa, siccitate subnitentia. *Inflorescentia* simpliciter racemosa, 2–8 cm. longa, dimidio inferiore vaginis imbricantibus acutis vel acuminatis vestita, superne usque ad 7-flora ; bracteae lanceolatae, acuminatae, ovario pedicellato multo breviores. *Flores* patentes, virides, purpureo-maculati, glabri, pedicello (cum ovario) 1–2 cm. longo. *Sepalum* intermedium elliptico-oblanceolatum, subacutum, 7 mm. longum, 2·2 mm. latum ; sepala lateralia oblique oblanceolata, breviter acuminata, 7·5 mm. longa, 3 mm. lata. *Petala* lanceolato-ligulata, acuta, 7·5 mm. longa, circiter 1 mm. lata. *Labellum* dimidio inferiore columnae adnatum, parte libera obovata obtusa, totum labellum 9 mm. longum, 4·5 mm. latum, ante columnam callis tribus intermedio humili lineari fere usque apicem labelli procurrente lateralibus erectis lateraliter compressis suborbicularibus intermedio multo brevioribus instructum. *Columna* 5 mm. longa, apice dilatata ; androclinii margo in alam angustam truncatum integram productus.

Trinidad : Arena forests via San Rafaeil, Aug. 1927, *Hombersley in Herb. W.E. Broadway* 6659 (type) ; Arena Road, March 1928, *Hombersley in Herb. Roy. Hort. Trinit.* 11949 ; St. Clair Experimental Station, on *Pithecellobium Saman*, Sept. 1918, *R. O. Williams in Herb. Roy. Hort. Trinit.* 8702.

This interesting species resembles *E. orchidiflorum* Salzm. in habit, particularly the rigid fleshy lanceolate leaves which dry pale brown. It also resembles *E. smaragdinum* Lindl. but has broader leaves. From these species, both of which are natives of British

Guiana, it differs in the entire lip. The name is given in compliment to Archdeacon Hombersley, who has for many years been a keen student of the Trinidad flora.

1299. **Dendrobium (§ Rhizobium) Grimesii** *White et Summerhayes* [Orchidaceae]; affine *D. teretifolio* R. Br., a quo sepalis petalisque brevioribus, sepalis 3-nerviis nec 5-nerviis, labelli lobis lateralibus magis evolutis, lobo intermedio breviore venis 5 parallelis instructo venis lateralibus divergentibus ramosis nullis distinguitur.

Herba epiphytica. *Caules* erecti, ramosi, multi-articulati, internodiis circiter 3 cm. longis et 3 mm. diametro. *Folia* singula in apicibus ramulorum, teretia, leviter 2–4-sulcata, recta vel leviter curvata, subacuta, 8–15 cm. longa, 5–6 mm. diametro. *Racemi* laterales, erecti, 6–10-flori; bracteae albo-hyalinae, parvae; pedicelli cum ovariis tenues, curvati, circiter 1 cm. longi. *Flores* luteo-albi. *Sepalum* intermedium lanceolato-lineare, acutum, 2·5 cm. longum; sepala lateralia 2·8 cm. longa, trinervia, mentum brevem subacutum formantia. *Petala* linearia, quam sepala angustiora, iis aequilonga. *Labellum* totum 1·8 cm. longum, ex ungue brevi cuneatim dilatatum, medio distincte trilobatum; lobi laterales rotundati, integri, 2 mm. lati; lobus intermedius longe acuminato-lanceolatus, apice reflexus, crenulato-crispatus, 1 cm. longus, supra basin 3 mm. latus; labellum carinis tribus inaequalibus intermedia quam lateralibus paulo longiore inferne strictis parallelis basi lobi intermedii undulatis superne venis 5 subparallelis instructum. *Gynostemii* pars libera brevis, purpurascens.

QUEENSLAND. Lake Barrine, near Atherton, Aug. 1932, *B. D. Grimes*.

An interesting species agreeing with *D. teretifolium* R. Br. in many features, but with thicker leaves and different floral characters, especially in the lip. The absence in the front lobe of lateral veins at right angles to the longitudinal ones is particularly noteworthy.

1300. **Diplachne malayana** *C.E. Hubbard* [Gramineae-Eragrosteae]; affinis *D. fuscae* Beauv., sed culmis gracilioribus et rigidioribus, laminis rigidiusculis fere laevibus, ligulis ad seriem ciliorum minutorum redactis, spiculis latioribus differt.

Gramen perenne caespitosum, 20–80 cm. altum; innovationes extravaginales. *Culmi* erecti, e rhizomate brevi orti, graciles, rigidi, compressi, simplices, glabri laevesque, 2–4-nodes, internodio supremo usque ad 50 cm. longo. *Foliorum vaginae* compressae, carinatae, persistentes, glabrae laevesque, inferiores internodiis longiores; ligulae ad seriem ciliorum minutorum redactae; laminae anguste lineares, tenuiter acutae, erectae, usque ad 25 cm. longae, convolutae vel planae et usque ad 4·5 mm. latae, rigidiusculae, glabrae, apice et marginibus apicem versus scaberulae. *Panicula* sublaxa, erecta vel nutans, 7–20 cm. longa; rhachis gracilis, scaberula; rami 4–12, solitarii, erecti vel paulo patentes, gracillimi,

3·5–10 cm. longi, laxe spiculati, subtriquetri, angulis scaberulis ; pedicelli usque ad 1·5 mm. longi. *Spiculae* appressae, 5–8 mm. distantes, anguste oblongae, obtusae, compressae, 5–8 mm. longae, 1·8–2 mm. latae, arcte 5–8-florae, stramineae vel purpurascentes. *Glumae* ambitu anguste lanceolatae, acutae, firme membranaceae, uninerves, carinatae, carinis scaberulae ; inferior 2–2·5 mm. longa ; superior 2·5–3·5 mm. longa. *Lemmata* ambitu oblique ovato-lanceolata vel ovata, explanata ovata vel late ovata, obtuse et breviter biloba, mucronata, 2·5–3 mm. longa, coriacea, prominenter trinervia, laevia, callo minuto piloso ; paleae anguste ellipticae, obtusae, lemmati aequilongae vel paulo breviores, carinis angustissime altis et ciliolatis. *Antherae* anguste oblongae, 0·5–0·75 mm. longae. *Caryopsis* anguste oblonga, subtriquetra, c. 1·3 mm. longa.

Siam : Nakawn Sritamarat, Songkla, Kampengpet, in savannah, under 50 m. alt., 28-vii-1928, *Kerr* 15978 ; Surat, Kanchanadit, edge of evergreen forest, c. 5 m. alt., 1-viii-1927, *Kerr* 13075 ; Puket, Kantang, 30-v-1919, *Haniff & Nur* 4701 (type).

Malay Peninsula : North Kedah, Changloo, 20-iii-1932, *Jacob in Herb. Singap.* 25883.

Borneo : Banjermassin (Bangarmassing), 1857–58, *Motley* 731.

XII—NOTES ON AFRICAN GRASSES : XV.

Ischaemum juncifolium *F. Ballard et C. E. Hubbard*, sp. nov. ; affine *I. Franksae* Wood, sed rhachi glabra, spiculis paullo minoribus, gluma inferiore dorso laevi differt.

Gramen perenne, dense caespitosum, 30–60 cm. altum. *Culmi* erecti, teretes, graciles, simplices, 1–2-nodes, glabri laevesque. *Folia* plerumque basalia ; vaginae basales persistentes, basim culmorum dense obtegentes, compressae, latiusculae, usque ad 10 cm. (vel ultra) longae, pallide fuscae, marginibus ciliatae, ore dense lanato-barbatae, superiores teretes, internodiis demum breviores, glabrae laevesque, plerumque auriculatae, auriculis minutis obtusis ; ligulae truncatae, usque ad 1 mm. longae, membranaceae ; laminae junciformes, erectae, angustissimae, rigidae, usque ad 35 cm. (vel ultra) longae, 1–1·25 mm. latae, leviter compressae vel subteretes, basim versus leviter canaliculatae, in canaliculo sericeo-pilosae, ceterum glabrae laevesque, virides. *Inflorescentia* angusta, erecta, 4·5–8 cm. longa ; axis primarius compressus, gracilis, fere laevis ; racemi 2–3, erecti, usque ad 5 cm. longi, solitarii ; articuli rhachis et pedicelli leviter compressi vel subtriquetri, superne leviter incrassati, fere laeves ; articuli 5–10 mm. longi, serie basali pilorum minutorum excepta glabri ; pedicelli 4–6 mm. longi. *Spiculae sessiles* lanceolatae vel anguste ovatae vel ovato-oblongae, acutae vel subacuminatae, 6–8 mm. longae (callo incluso), earistatae, glabrae, pallide virides et purpureo-tinctae. *Gluma* inferior dorso plana, bicarinata, marginibus angustissimis inflexis, coriacea, 7–11-nervis, carinis minute scaberula ; gluma superior carinata, explanata ovato-oblonga, acuta, firme membranacea, 3-nervis. *Anthoecium inferum*

sterile : lemma explanatum lanceolato-oblongum, acutum vel obtusum, usque ad 6 mm. longum, hyalinum, 3-nerve, marginibus ciliolatum ; palea lineari-lanceolata, usque ad 5 mm. longa, bicarinata, carinis scaberula. *Anthoecium superum* ♀ : lemma explanatum ovato-oblongum, subacuminatum, usque ad 5·5 mm. longum, hyalinum, 3–nerve, marginibus ciliolatum ; palea explanata lanceolato-oblonga, usque ad 5 mm. longa, ciliolata ; antherae 3–3·5 mm. longae. *Spiculae pedicellatae* spiculis sessilibus subsimiles, circiter 6 mm. longae, glabrae. *Gluma* inferior dorso plerumque convexa vel superne carinata, explanata anguste ovata vel ovata, acuta, 7–9-nervis ; gluma superior carinata, explanata ovato-oblonga, acuta, 3-nervis. *Anthoecium inferum* sterile : lemma circiter 5 mm. longum; palea 4 mm. longa. *Anthoecium superum* ♂ : lemma circiter 4·5 mm. longum ; palea 3·5 mm. longa.

Northern Rhodesia : Mwinilunga District ; near Matonchi Farm, in damp dambo by Dobekka stream, Sept. 1930, *Milne-Redhead* 1004.

Rhytachne pilosa *F. Ballard et C. E. Hubbard*, sp. nov. ; affinis *R. robustae* Stapf, sed nodis vaginarum glabris, racemis brevioribus argenteo-pilosis differt.

Gramen perenne, caespitosum, usque ad 80 cm. altum ; innovationes extravaginales. *Culmi* e rhizomate brevi erecti, teretes, simplices, 1–2-nodes, racemum versus pilis albis appressis dense pilosi, ceterum glabri laevesque. *Foliorum vaginae* glabrae vel basales pilis albis paucis minutae, ore barbatae, tenuiter striatae, basales persistentes, superiores internodiis breviores ; ligulae rotundato-truncatae, usque ad 1·5 mm. longae, membranaceae, glabrae ; laminae lineares, in acumen tenue attenuatae, usque ad 20 cm. longae, 2–5 mm. latae, planae vel siccitate arcte convolutae, rigidiusculae, pilis albis nitentibus brevibus appressis dense pilosae, demum glabrescentes vel superiores glabrae, supra prominenter nervosae et minute asperulae, subtus laeves. *Racemi* spiciformes, cylindrici, rigide erecti, 6–9 cm. longi, 3–4 mm. lati, atropurpurei, argenteo-pilosi ; articuli lineares, 5–10 mm. longi, apice plus minusve oblique cupulati, latere exteriore convexi et appresse pilosi, latere interiore leviter concavi et glabri, basi dense barbati ; pedicelli lineares, 6–7·5 mm. longi, dorso compressi, marginibus ciliati, dorso laxe pilosi. *Spiculae sessiles* lanceolato-oblongae, vel oblongae, 6·5–10 mm. longae. *Gluma* inferior subacuta, dorso leviter convexa, marginibus anguste inflexis, coriacea, crugosa, 7-nervis, minute asperula, nervis superne breviter pilosis, carinis ciliatis ; gluma superior inferiore paullo brevior, navicularis, acuta, membranacea, 3-nervis, carinata, carina inferne scaberula superne ciliata, marginibus ciliatis. *Anthoecium inferum* ♂ : lemma glumis paullo brevius, explanatum ovato-oblongum, truncatum, hyalinum, 2-nerve, ciliolatum ; palea lemmati similis sed oblonga. *Anthoecium superum* ♀ : lemma explanatum oblongum, subacutum, hyalinum, 3-nerve, ciliolatum ; palea lemmati aequilonga, oblonga, 2-nervis. *Spiculae pedicellatae*

ad glumas duas redactae ; gluma inferior ovata, in setam ciliolatum attenuata, seta inclusa usque ad 6 mm. longa ; gluma superior minuta.

Northern Rhodesia : Mwinilunga District ; between Mwinilunga and Matonchi Farm, early burnt dambo, in sandy peaty damp acid soil, August 1930, *Milne-Redhead* 987.

Hemarthria altissima (*Poir.*) *Stapf et C. E. Hubbard*, comb. nov. *Rottboellia altissima* Poir. Voy. Barb. **2,** 105 (1789). *R. fasciculata* Lamk. Illustr. Gen. **1,** 204 (1791) ; Desf. Fl. Atl. **1,** 110, tab. 36 ; Poir. in Lam. Encycl. Meth. Bot. **6,** 311 (1804), Suppl. **4,** 718 (1816), et Hist. Plant. **2,** 455 (1825). *R. compressa* var. *fascculata* Hack. in DC. Monogr. Phan. **6,** 286 (1889). *Lodicularia fasciculata* Beauv. Agrost. 166 (1812). *Lepturus fasciculatus* Trin. Fund. Agrost. 123 (1820). *Andropogon altissimus* Raspail in Ann. Sc. Nat. Ser. 1, **5,** 307 (1825). *A. fasciculatus* Raspail, l.c. *Hemarthria fasciculata* Kunth, Rév. Gram. **1,** 153 (1829) ; Stapf in Prain, Fl. Trop. Afr. **9,** 55.

Distrib. North, tropical and South Africa.

Rottboellia fasciculata Lamk. is apparently based on *R. altissima* Poir. which Lamarck cites as a synonym. Poiret, although using Lamarck's name, repeatedly states that he considers *R. fasciculata* to be the same as his species (see Poiret, Hist. Plant. **2,** 455 and in Lamk. Encycl. Meth. Bot. Suppl. **4,** 718).

Bothriochloa intermedia (*R. Br.*) *A. Camus* var. **acidula** (*Stapf*) *C. E. Hubbard*, comb. nov. *Amphilophis intermedia* var. *acidula* Stapf in Prain, Fl. Trop. Af. **9,** 174 (1917).

Distrib. Cape Verde Islands, Gold Coast, Angola, West Indies.

Mdlle. A. Camus in Ann. Soc. Linn. Lyon, **76,** 162 (1931) has pointed out that *Amphilophis* Nash (in Britt. Man. Fl. North. States & Canada, ed. 1, 71 : 1901) is synonymous with *Bothriochloa* O. Kuntze (Rev. Gen. Pl. **2,** 762 : 1891). She has made the following new combinations for the species of *Bothriochloa* which occur in Africa :—*B. radicans* A. Camus (*Amphilophis radicans* Stapf) ; *B. intermedia* A. Camus (*Andropogon intermedius* R.Br., *Amphilophis intermedia* Stapf) ; *B. glabra* A. Camus (*Andropogon glaber* Roxb., *Amphilophis glabra* Stapf) ; *B. pertusa* A. Camus (*Andropogon pertusus* Willd., *Amphilophis pertusa* Stapf) ; *B. insculpta* A. Camus (*Andropogon insculptus* Hochst., *Amphilophis insculpta* Stapf).

Bothriochloa insculpta (*Hochst.*) *A. Camus* var. **vegetior** (*Hack.*) *C. E. Hubbard*, comb. nov. *Andropogon pertusus* var. *vegetior* Hack. in DC. Monogr. Phan. **6,** 481 (1889). *Amphilophis insculpta* Stapf var. *vegetior* Stapf in Prain, Fl. Trop. Afr. **9,** 177 (1917).

Distrib. Eritrea, Sudan and Uganda.

Sorghum Friesii (*Pilger*) *C. E. Hubbard*, comb. nov. *S. micratherum* Stapf in Prain, Fl. Trop. Afr. **9,** 142 (1917). *Andropogon Friesii* Pilger in R. E. Fries, Wiss. Ergebn. Schwed. Rhod.–Kongo–Exped. 1911–12, **1,** 195 (1916).

Distrib. Northern and Southern Rhodesia, Portuguese East Africa and Angola.

Rhynchelytrum repens (*Willd.*) *C. E. Hubbard*, comb. nov. *R. roseum* Stapf et C. E. Hubbard ex Bews, The World's Grasses, 223 (1929) and in Prain, Fl. Trop. Afr. **9,** 880 (1930). *Saccharum repens* Willd. Sp. Pl. **1,** 322 (1798). *Tricholaena rosea* Nees, Cat. Sem. Hort. Vratisl. 1835 and in Linnaea, **11,** Lit. Ber. 129 (1837).

Distrib. Tropical and South Africa, Arabia; introduced into many parts of the world.

Saccolepis squamigera (*Pilger*) *C. E. Hubbard*, comb. nov. *Panicum squamigerum* Pilger in R. E. Fries, Wiss. Ergebn. Schwed. Rhod.–Kongo–Exped. 1911–12, **1,** 203, t. 15, figs. 1–3 (1916).

Distrib. Northern Rhodesia.

Saccolepis cinereo-vestita (*Pilger*) *C. E. Hubbard*, comb. nov. *Panicum cinereo-vestitum* Pilger in R. E. Fries, Wiss. Ergebn. Schwed. Rhod.–Kongo–Exped. 1911–12, **1,** 201, t. 14, fig. 2 (1916).

Distrib. Northern Rhodesia.

Digitaria albomarginata *Stent*, sp. nov.; affinis *D. diversinervi* Stapf, sed spiculis angustioribus acutissimis, laminis rigidis hirsutis, marginibus laminarum albis cartilagineis, racemis laxis paucis differt.

An erect or semi-postrate perennial sending out leafy stolons with very short internodes. *Culms* slender, up to about 25 cm. high, leafy and several-noded in the lower half, glabrous, smooth, branched or occasionally simple; lower internodes short and like the uppermost not or only shortly exceeding the sheaths. *Leaf-sheaths* rather tight, the lower softly hairy, the upper often glabrescent; ligule reduced to a membranous rim; blades linear-lanceolate, acute, up to 4 cm. long by 3 mm. broad, rather firm, hairy all over, with conspicuous white cartilaginous margins. *Racemes* 2 at the tips of the culms, rarely 1 or 3, up to 7 cm. long; rhachis about 0·7 mm. broad, flexuous, trigonous, with narrowly winged scabrid margins; pedicels paired, the longer up to 3 mm. long, angular and scabrid, the other very short, sometimes suppressed. *Spikelets* not imbricating, narrowly lanceolate, acute, up to 3·5 mm. long by 1 mm. wide, appearing glabrous. *Lower glume* a thin whitish broadly obtuse membranous scale about 0·7 mm. long; upper narrowly ovate, acuminate, equalling about half the length of the spikelet, thin, 3-nerved, with a few short soft acute hairs between the nerves and on the margins. *Lower lemma* equalling the spikelet, prominently 9-nerved, with lines of short fine obtuse appressed hairs between the middle pair of lateral nerves and on the margins, nerves smooth. *Upper lemma* and palea chartaceous, pallid, the flaps of the former rather broad but not overlapping.

Natal: Umbogintwini; African Explosives Experiment Station, *D. Moses in Govt. Herb. Salisbury*, 3767, 4041.

Very near to *Digitaria diversinervis* Stapf, from which it differs in the very hairy and firmer leaf-blades with their conspicuous white margins, fewer and laxer racemes and less closely ribbed lower lemma. This grass is growing in the experiment area at Umbogintwini side by side with *Digitaria diversinervis* and the difference in the texture of the foliage is most noticeable.

Digitaria phaeotricha *Robyns* var. **paucipilosa** *F. Ballard et C. E. Hubbard*, var. nov. ; a typo differt culmis erectis, nodis glabris, foliorum vaginis haud auriculatis, laminis usque ad 36 cm. longis et 3 mm. latis, lemmate anthoecii superi inter nervos laterales et ad margines pilorum brevium seriebus quattuor nec sex praedito.

Northern Rhodesia : Mwinilunga District ; near Matonchi Farm, in damp dambo by Dobekka stream, burnt early, Sept. 1930, *Milne-Redhead* 1003.

We are indebted to Prof. W. Robyns, Director of the Brussels Botanic Garden, for comparing our specimen with the type of *Digitaria phaeotricha* which he had on loan from the herbarium at Turin.

Digitaria scalarum *Chiov.* var. **elgonensis** *C. E. Hubbard et J. D. Snowden*, var. nov. ; a typo differt culmis 7·5–15 cm. longis, foliorum laminis 1–3 cm. longis 2·3 mm. latis, racemis 2–3, 1–3·5 cm. longis, spiculis acutis 2·5 mm. longis.

Uganda : Bugishu, Bulago, 1800–2400 m., Aug. 1927, *Snowden* 1180 ; Butandiga, 2100 m., Dec. 1927, *Snowden* 1233 (type), 1234A ; 2400 m., *Thomas* 487.

This dwarf variety of *D. scalarum* is abundant in pastures on the slopes of Mt. Elgon where it is associated with *Pennisetum clandestinum* Hochst. or at higher altitudes replaces that species.

Vern. Name : *Nanzigi* (Lugishu).

Eriochloa parvispiculata *C. E. Hubbard*, sp. nov. ; affinis *E. procerae* C. E. Hubbard, sed racemis brevioribus, spiculis multo minoribus differt.

Gramen perenne, laxe caespitosum. *Culmi* geniculato-adscendentes, 50 cm. (vel ultra) alti, graciles, paullo compressi, simplices vel ramosi, 3-nodes, glabri laevesque. *Folia* glabra ; vaginae demum internodiis breviores, compressae, carinatae, tenuiter striatae, laeves, basales persistentes ; ligulae ad seriem pilorum minutorum redactae ; laminae lineares, basi leviter contractae, apice acutae, usque ad 13 cm. longae et 4·5 mm. latae, planae, virides, marginibus apicem versus scaberulae, ceterum laeves. *Panicula* angusta, erecta, contracta, 9 cm. longa, 1·5 cm. lata, pallide viridis ; axis primarius gracilis, subteres, scaberulus ; racemi 17, erecti vel paullo patentes, simplices vel inferne ramis brevibus 3-4-spiculatis ramosi, dense spiculati, sessiles vel inferne breviter pedunculati, inferiores usque ad 3 cm. longi, superiores breviores ; rhachis dorso plana, usque ad 0·6 mm. lata, triquetra, scaberula ; pedicelli bini vel racemorum apicem versus solitarii, usque ad 1 mm. longi,

tenuiter scaberuli, apice subdiscoidei. *Spiculae* dense imbricatae, 4–2-seriatae, elliptio- vel ovato-oblongae, acutae, plerumque mucronulatae, 2–2·3 mm. longae. *Gluma* inferior cupuliformis, usque ad 0·2 mm. longa, viridis vel atropurpurea, glabra ; gluma superior tenuiter acuta, plerumque mucronulata, spiculae aequilonga et ambitu similis, tenuiter membranacea, obscure 5-nervis. *Anthoecium inferum* ad lemma redactum : lemma glumae superiori simile. *Anthoecium superum* ♀, elliptico-oblongum, usque ad 1·7 mm. longum : lemma tenuiter punctatum, glabrum, mucrone usque ad 0·25 mm. longo scaberulo praeditum.

ZANZIBAR : without precise locality, *Vaughan* 1607.

Urochloa platyrrhachis *C. E. Hubbard*, sp. nov. ; a ceteris speciebus rhachi complanata herbacea usque 5 mm. lata differt.

Gramen annum (?), basi ignota. *Culmi* geniculato-adscendentes, usque ad 40 cm. longi, gracillimi, ramosi, usque ad 6-nodes, nodis pubescentibus, ceterum glabri laevesque. *Foliorum vaginae* laxae, teretes, plerumque internodiis breviores, tenuiter nervosae, glabrae vel sparse pubescentes ; ligulae ad seriem ciliorum redactae ; laminae lineares vel lineari-lanceolatae, basi leviter contractae, acutae, 2·5–7 cm. longae, 2·5–6 mm. latae, planae, virides, flaccidae, puberulae et plerumque pilis paucis longioribus laxe adspersae, marginibus ciliatis. *Racemi* 1–2, sessiles, secundi, spiciformes, 3·3–4 cm. longi ; rhachis multo complanata, tenuis, herbacea, usque ad 5 mm. lata, minute puberula vel glabra, marginibus scaberulis, costa media tortuosa, gracillima, internodiis brevissimis ; pedicelli minutissimi. *Spiculae* biseriatae, alternatae, leviter imbricatae, late oblongae vel elliptico-oblongae, obtusae, 3·5–3·8 mm. longae, albido-virides, fere glabrae. *Glumae* inaequales ; inferior oblata, usque ad 0·5 mm. longa, enervis ; superior explanata late elliptica, obtusissima, spiculae aequilonga, membranacea, tenuiter 7-nervis, glabra. *Anthoecium inferum* ♂ vel sterile : lemma explanatum late ellipticum, obtusum, spiculae aequilongum, in dorso sulco mediano angusto tenuissimo facile scisso percursum, ceterum firme membranaceum, 5-nerve, pilis paucis minutis e tuberculis ortis sparse adspersum ; palea lemmati aequilonga, inter carinas hyalina, carinis anguste alatis. *Anthoecium superum* ♀ : lemma late ellipticum, obtusum, mucronulatum, 2·5 mm. longum, dorso valde compressum, tenuiter crustaceum, apice minute puberulum, fere laeve, 5-nerve ; palea lemmati aequilonga. *Antherae* 2 mm. longae. *Caryopsis* orbicularis, 1 mm. longa.

BELGIAN CONGO : Sakania, June 1931, *Mundy in Govt. Herb. Salisbury* 5038.

Urochloa lata (*Schum.*) *C. E. Hubbard*, comb. nov. *U. insculpta* Stapf in Prain, Fl. Trop. Afr. **9**, 599 (1920). *Panicum latum* Schum. Beskr. Guin. Pl. 61 (1827). *P. insculptum* Steud. Syn. Pl. Glum. **1**, 49 (1854). *P. hamadense* Mez in Notizbl. Bot. Gart. Mus. Berlin, **7**, 66 (1917).

Distrib. French Guinea to Nigeria, French Equatorial Africa, Sudan, Eritrea and Abyssinia.

Panicum Pole-Evansii *C. E. Hubbard*, sp. nov. ; affine *P. adenophoro* K. Schum., sed spiculis minoribus, gluma inferiore uninervi, gluma superiore et lemmate inferiore 7-nervibus differt.

Gramen perenne (?). *Culmi* scandentes, geniculati, plus minusve graciles, teretes, multinodes, ramosi, pilis patentibus aliis e tuberculis ortis aliis glandulosis admixtis breviter pilosi ; internodia inferiora 1·5–6 cm. longa, internodium supremum (pedunculus) usque ad 18 cm. longum. *Foliorum vaginae* plerumque internodiis breviores, teretes, tenuiter striatae, demum solutae, dense pilosae, nodos versus laxe barbatae ; ligulae ad seriem ciliorum redactae ; laminae lineari-lanceolatae vel lanceolatae, basi leviter rotundatae, acutae, 1–5 cm. longae, 2–7 mm. latae, planae, patentes vel demum reflexae, virides, dense pubescentes vel supra glabrescentes, pilis tenuibus nonnullis glandulosis, marginibus scaberulis. *Panicula* ambitu ovata vel oblonga, tripinnata, laxa, 4–9 cm. longa ; rhachis, rami et ramuli pilis patentibus nonnullis glandulosis admixtis breviter pilosi ; rhachis filiformis ; rami laxe divisi, flexuosi, inferiores usque ad 5 cm. longi ; pedicelli valde inaequales, 1–6 mm. longi. *Spiculae* oblongae vel elliptico-oblongae, obtusae, 2 mm. longae, turgidulae, glabrae, albidae vel purpureo-suffusae. *Glumae* inaequales, membranaceae, concavae, tenuinerves ; inferior explanata lanceolato-ovata, obtusa, 1 mm. longa, 1-nervis ; superior explanata late elliptico-oblonga, obtusissima, spiculae subaequilonga, 7-nervis. *Anthoecium inferum* ♂ : lemma glumae superiori valde simile, spiculae aequilongum ; palea 2 mm. longa, carinis laevibus. *Anthoecium superum* ♀, elliptico-oblongum, subobtusum, 2 mm. longum : lemma atque palea tenuiter crustacea, laevis vel obscure granulosa.

Northern Rhodesia : at river 9 miles south of Lake Tanganyika, creeping over rocks, July 1930, *Pole Evans* 3039 (46).

Melinis Gossweileri *C. E. Hubbard*, sp. nov. ; affinis *M. macrochaetae* Stapf et C. E. Hubbard, sed gluma superiore leviter gibbosa 9-nervi, anthoecio infero ♂, lemmate infero angustiore, pedicellis hirsutis differt.

Gramen annuum. *Culmi* geniculato-adscendentes, usque ad 80 cm. alti, graciles, ramosi, teretes, 8–10-nodes, laeves, glabri vel paniculam versus pubescentes. *Foliorum vaginae* solutae, internodiis breviores, tenues, pallidae, laeves, glabrae vel ore puberulae ; ligulae ad seriem brevem ciliorum redactae ; laminae lineari-lanceolatae, tenuiter acutae, 4–10 cm. longae, 4–7 mm. latae, planae, tenues, virides, laeves, glabrae vel sparse hirsutae. *Panicula* linearis vel lineari-lanceolata, contracta, pallide viridis, 9–10 cm. longa, 1–1·5 cm. lata ; rhachis et rami pilis patentibus mollibus albis dense hirsuti ; rhachis gracilis, leviter flexuosa ; rami erecti vel adscendentes, tenuiter filiformes, solitarii, laxe ramosi, usque ad

5 cm. longi; pedicelli 0·3–1·5 mm. longi, infra apicem leviter incrassatum pilis ad 1·5 mm. longis argenteo-nitentibus muniti. *Spiculae* lanceolatae vel lanceolato-oblongae, 2·3–2·5 mm. longae, pallide virides, superne pilosae. *Gluma inferior* ad marginem minutam hyalinam angustam redacta; gluma superior spiculae aequilonga, dorso leviter gibbosa, explanata elliptica vel elliptico-oblonga, tenuiter membranacea, 9-nervis, superne marginibus ciliata, supra medium dorsum fasciculis pilorum erectorum in unam seriem transversam dispositis, minute biloba, arista gracili scaberula usque ad 4·5 mm. longa e sinu exoriente instructa. *Anthoecium inferum* ♂: lemma anguste oblongum, obtusum, 2 mm. longum, tenuiter membranaceum, 3-nerve, marginibus et nervo medio ciliatum; palea anguste oblonga, lemmati aequilonga, bicarinata, carinis longe ciliatis. *Anthoecium superum* ♀, lanceolatum vel anguste ovatum, subacutum, glabrum atque laeve, 1·8–2 mm. longum; lemma obscure 3-nerve. *Antherae* 1·5 mm. longae.

ANGOLA: Mossamedes; Huilla, 1500 m., 1931, *Gossweiler* 9408.

A very distinct species, differing from all other members of the genus in having a 9-nerved and slightly gibbous upper glume.

Dignathia ciliata *C. E. Hubbard*, sp. nov.; a ceteris speciebus differt panicula majore, spiculis ramulisque pilis longis dense ciliatis, glumis lineari-lanceolatis.

Gramen perenne. *Culmi* erecti vel geniculati, graciles, usque ad 30 cm. alti, teretes, multinodes, ramosi, ramis erectis, glabri laevesque. *Foliorum vaginae* internodiis longiores, teretes, arcte appressae, glaucae, minutissime scaberulae, ore laxe barbatae, ceterum glabrae; ligulae truncatae vel rotundatae, usque ad 1 mm. longae, membranaceae, ciliolatae; laminae lineares, basi leviter contractae, tenuissime acutae, 6–11 cm. longae, usque ad 4 mm. latae, planae vel arcte convolutae, rigidulae, supra virides, subtus glaucae vel glauco-purpureae, glabrae laevesque. *Racemus* spiciformis, densiusculus, cylindricus, erectus, 2·5–6 cm. longus, 10–12 mm. latus, viridis, sericeo-pilosus; rhachis gracillima, angulata, scaberula; ramuli oblique patentes, basi disarticulati, triquetri, superne paullo incrassati, angulis pilis albis patentibus usque ad 1·5 mm. longis dense ciliati, parte nuda (pedunculo) usque ad 2·5 mm. longa, spiculas duas gerentes. *Spicula fertilis* ovata vel ovato-oblonga et hians, 5–6 mm. longa, lateraliter compressa, viridis et purpureo-tincta; rhachilla producta, usque ad 1 mm. longa. *Glumae* a latere visae oblique lineari-lanceolatae, acute acuminatae, in cuspidem brevem erectam vel leviter recurvam terminantes, dorso late cartilagineo-incrassatae, marginibus angustis hyalinis, carinatae, carina purpurea pilis albis patentibus e tuberculis ortis usque ad 2 mm. longis dense ciliatae; gluma inferior 4–4·5 mm. longa, marginibus ciliolatis; superior spiculae aequilonga. *Lemma* a latere visum semi-ovatum, acutum, seta usque ad 1 mm. longa scaberula terminatum, 3·5–4 mm. longum, firme membranaceum, 3-nerve, nervis lateralibus marginibus approximatis, carinatum, carina ciliolata. *Palea* lanceolata,

3–3·5 mm. longa. *Caryopsis* oblique oblongo-ovoidea, lateraliter compressa, 2 mm. longa. *Spicula sterilis* ad glumas redacta, pedicellata, pedicello triquetro usque ad 1·5 mm. longo dense ciliato. *Glumae* aequales, lineari-lanceolatae, acuminatae, 3·5–4 mm. longae, apice erectae vel leviter recurvae, cartilagineo-incrassatae, carina dense ciliatae.

British Somaliland: Haud, 570 m., common, May 1930, *B. Godfrey Fausset* 46.

Vern. Name: *Fodarder.*

Eragrostis pseudopoa *C. E. Hubbard*, sp. nov.; affinis *E. keniensi* Pilger, sed spiculis laxe 5–8-floris purpureo et flavido-fusco-variegatis, lemmatibus longioribus ambitu lanceolato-oblongis obtusis differt.

Gramen perenne; rhizoma durum validiusculum, cataphyllis brevibus glabris obtectum; innovationes extravaginales. *Culmi* erecti vel basi leviter geniculati, circiter 50 cm. alti, graciles, simplices, 2–3-nodes, glabri laevesque, internodio summo (pedunculo) longe exserto. *Foliorum vaginae* striatae, laxae, ore breviter barbatae et marginibus ciliatae vel glabrae, basales persistentes; ligulae ad seriem ciliorum brevissimorum redactae; laminae lineares, in apicem callosum obtusum attenuatae, planae vel siccitate involutae, adscendentes, usque ad 10 cm. longae et 3 mm. latae, firmae, glabrae laevesque. *Panicula* laxa, flexuosa, nutans, 7–11 cm. longa; rhachis filiformis, flexuosa, glabra laevisque; rami distantes, solitarii, basin versus espiculati, subcapillares, flexuosi, glabri, laeves vel glandulis paucis patelliformibus sessilibus praediti, inferiores usque ad 4 cm. longi, 2-5-spiculati, superiores breviores, 2–1-spiculati; pedicelli ut rami glanduliferi, laterales 4–12 mm. longi, terminales usque ad 20 mm. longi. *Spiculae* ovatae vel late ovatae, acutae, 6–9 mm. longae, 4–6 mm. latae, lateraliter compressae, purpureo- et flavido-fusco-variegatae, laxe 5–8-florae, glabrae; rhachilla persistens. *Glumae* subaequales, ambitu lineari-lanceolatae, acutae vel subobtusae, 4·5–5 mm. longae, membranaceae, uni- vel subtri-nerves, carina supra medium leviter scaberulae. *Lemmata* laxe imbricata, ambitu lanceolato-oblonga, obtusa, explanata ovata vel ovato-oblonga et obtusa vel subtruncata, 4–5 mm. longa, membranacea, apice flavido-fusco excepto purpurea, nervis lateralibus prominentibus, marginibus inflexis, carina apicem versus minute scaberula. *Paleae* deciduae, lemmati subaequilongae, explanatae oblongae vel elliptico-oblongae, truncatae vel obtusissimae, carinis fere laevibus. *Antherae* 3, lineares, circiter 2·5 mm. longae.

Tanganyika Territory: Iringa Province, Ifunda, c. 1800 m., Nov. 1928, *Haarer* 1659.

Eragrostis Rogersii *C. E. Hubbard*, sp. nov.; affinis *E. Dinteri* Stapf, sed panicula laxa ovata vel oblonga, lemmatibus ambitu ovato-oblongis acutis vel subobtusis haud acuminatis differt.

Gramen annuum. *Culmi* suberecti vel geniculato-adscendentes, 30–45 cm. alti, graciles, teretes, glabri laevesque, 3–10-nodes, infra nodos glandulis paucis sessilibus patelliformibus praediti, simplices vel infra medium ramosi, internodiis inferioribus usque ad 3·5 cm. longis, internodio summo (pedunculo) usque ad 16 cm. longo. *Foliorum vaginae* internodiis paullo breviores vel paullo longiores, striatae, superne obscure carinatae, ore barbatae, marginibus ciliatae, carina et plerumque nervis prominentibus glandulosae ; ligulae ad seriem ciliorum redactae ; laminae lineares, in apicem tenuem scaberulum attenuatae, 3–10 cm. longae, 2·5–4·5 mm. latae, planae vel siccitate convolutae, virides vel subglaucae, glabrae vel supra sparse pilosae, subtus laeves, supra et marginibus glanduliferis scaberulae. *Panicula* ovata vel oblonga, suberecta, laxa, 8–14 cm. longa, 3–8 mm. lata ; rhachis et rami angulati, glandulosi, angulis scaberuli, axillis breviter barbati, ceterum glabri ; rami plerumque simplices, solitarii, gracillimi, 6–1-spiculati, usque ad 5 cm. longi ; pedicelli patentes, glandulosi, 2–6 mm. longi. *Spiculae* ovatae, ellipticae vel oblongae, lateraliter valde compressae, 6–14 mm. longae, 3–4 mm. latae, dense 10–25-florae, pallide viridi- et purpureo-variegatae ; rhachilla disarticulata. *Glumae* aequales, ambitu lanceolatae, tenuiter acutae, 3–4 mm. longae, chartaceae, acute carinatae, carina supra medium spinoso-ciliolatae, marginibus ciliolatae vel glabrae ; inferior uninervis ; superior uni- vel tri-nervis. *Lemmata* ambitu ovato-oblonga, acuta vel subobtusa, plerumque mucronulata, explanata late elliptico-oblonga et obtusa, 3·5 mm. longa, acute carinata, carina supra medium scaberula, chartacea, trinervia. *Paleae* cum lemmatibus deciduae, 2·5 mm. longae, carinis curvatis rigide ciliolatae. *Antherae* 3, lineares, 1 mm. longae. *Caryopsis* subglobosa, 0·6 mm. longa.

Northern Rhodesia : Livingstone, in sand, 900 m., April 1909, *Rogers* 7027 (type) ; July 1909, *Rogers* 7200.

Southern Rhodesia : Victoria Falls, 900 m., April 1930, *Harrison in Herb. Brain*, 1318 ; Wankie District, near Fuller Siding, March 1929, *Pardy in S. Rhod. Govt. Herb.* 4854 ; March 1930, *Pardy in S. Rhod. Govt. Herb.* 4815 ; Chababonda, Feb. 1929, *Pardy in S. Rhod. Govt. Herb.* 4521 ; Nyamandhlovu District, March 1929, *Pardy in S. Rhod. Govt. Herb.* 4880.

Eragrostis plurigluma *C. E. Hubbard*, sp. nov. ; affinis *E. invalidae* Pilger, sed culmis et foliis validioribus, panicula majore, spiculis late ellipticis vel late elliptico-oblongis, glumis vacuis 5–6 differt.

Gramen perenne. *Culmi* erecti, usque ad 1·2 m. alti, validiusculi, teretes, simplices, glabri laevesque, 2-nodes, internodio summo (pedunculo) usque ad 36 cm. longo. *Folia* plerumque basalia, glabra acque laevia ; vaginae basales usque ad 12 cm. longae, pallidae, striatae, superiores arcte appressae, teretes, internodiis breviores ; ligulae ad seriem obscuram pilorum brevissimorum redactae ; laminae apice obtusae et callosae, usque ad 45 cm. longae, convolutae vel

involutae, explanatae usque ad 2·5 mm. latae, rigidae, pallide virides. *Panicula* oblonga, laxissima, leviter nutans, 27 cm. longa, 9 cm. lata; rhachis glabra, inferne laevis, superne minute scaberula; rami solitarii, adscendentes, tenuiter filiformes vel capillares, glabri, minute scaberuli, laxe divisi, superne flexuosi, usque ad 10 cm. longi; ramuli et pedicelli capillares, flexuosi; pedicelli usque ad 2 cm. longi, apice leviter incrassati. *Spiculae* late ellipticae vel late elliptico-oblongae, obtusae, 6–7·5 mm. longae, 3·8–4·5 mm. latae, lateraliter valde compressae, arcte 8–14-florae, glabrae, pallide virides et purpureae; rhachilla persistens. *Glumae vacuae* 5–6, acute carinatae, carina tenuiter scaberulae, chartaceae; I ambitu lanceolata, acuta, 1·2–1·6 mm. longa, uninervis; II primae similis sed paullo latior et 2 mm. longa; III ambitu lanceolato-oblonga, acuta, 2·3 mm. longa, uni- vel subtri-nervis; IV tertiae similis sed minus acuta, 2·5–2·7 mm. longa, trinervis; V (et VI) ambitu oblonga, subacuta, 3 mm. longa, trinervis. *Lemmata* arcte imbricata, ambitu oblonga vel ovato-oblonga, subobtusa, acute carinata, 3 mm. longa, chartacea, laevia, trinervia. *Paleae* deciduae, oblanceolato-oblongae, 2·3 mm. longae, carinis dense ciliolatis. *Antherae* 3, lineares, 1·4 mm. longae. *Caryopsis* anguste oblonga, subteres, 1 mm. longa.

Sierra Leone: Northern Province; in swampy fields at Materboi, Oct. 1928, *Glanville* 79.

Bracteola orientalis *C. E. Hubbard*, sp. nov.; affinis *B. subaequiglumae* C. E. Hubbard, comb. nov. (*Chloris subaequigluma* Rendle), sed culmis valde compressis, ligulis brevioribus, spicis plerumque longioribus, gluma superiore prope carinam 4–7-nervi mucronulata haud aristata, paleae carinis superne ciliolatis differt.

Gramen perenne, stolonibus compressis repentibus glabris e nodis radicantibus. *Culmi* erecti, usque ad 70 cm. alti, graciles, valde compressi, rigidi, flavescentes, 2–3-nodes, circiter medium culmum ramosi, glabri, nitentes. *Foliorum vaginae* valde compressae, acute carinatae, firmae, laeves, ore pilis minutis exceptis glabrae, basales persistentes, latae, dense imbricatae, superiores internodiis multo breviores; ligulae truncatae, circiter 0·3 mm. longae, ciliolatae; laminae lineares, arcte conduplicatae et carinatae, basi leviter constrictae, explanatae apice obtusae vel rotundatae vel emarginatae et apiculatae, usque ad 12·5 cm. longae, explanatae usque ad 8 mm. latae, strictae vel curvatae, rigidae, glaucae, marginibus et costa media superne scaberulae. *Spicae* binae, usque ad 14·5 cm. longae, suberectae, graciles, flavidae; rhachis triquetra, gracillima, 0·5 mm. lata, minute scaberula. *Spiculae* dense imbricatae, lanceolatae vel oblongo-lanceolatae vel oblongae, acutae, 4·3–5 mm. longae, valde compressae. *Glumae* spiculae aequilongae, firme membranaceae; inferior ambitu oblique lanceolato-linearis, acuta, carinata, carina scaberula, 1-nervis; superior ambitu oblique lanceolata, obtusa, mucronulata, dorso subrotundata, 4–7-nervis, nervis lateralibus prope carinam scaberulam. *Anthoecium inferum*: lemma ambitu

late lanceolatum, acutum, explanatum ovatum, carinatum, 4–4·3 mm. longum, breviter aristatum, arista erecta scaberula usque ad 1 mm. longa, firme chartaceum vel coriaceum, 3-nerve, carina et nervis lateralibus dense longiciliatum ; palea anguste lanceolata, 3–3·8 mm. longa, carina superne ciliolata vel scaberula ; antherae 1–1·3 mm. longae. *Anthoecium superum* ad lemma redactum, angustum, 3–3·5 mm. longum, muticum, glabrum.

TANGANYIKA TERRITORY : without precise locality, 1932, *Staples* 407 (type).

KENYA COLONY : Kavirondo, Nyando, 1260 m., very common, Feb. 1930, *Lyne Watt* 1411.

Tripogon Snowdenii *C. E. Hubbard*, sp. nov., affinis *T. Mannii* Hook. f., sed laminis pubescentibus, spiculis plerumque longioribus usque ad 15-floris, lemmatibus aristatis, paleis bifidis differt.

Gramen perenne, dense caespitosum, 15–60 cm. altum. *Culmi* erecti, teretes, gracillimi, simplices, 1–2-nodes, glabri laevesque ; internodium supremum usque ad 23 cm. longum. *Folia* plerumque basalia ; vaginae laeves, teretes, ore molliter barbatae, basales persistentes, usque ad 10 cm. longae, pallidae ; ligulae ad seriem ciliorum minutorum redactae ; laminae filiformes vel angustissime lineares, obtusae, erectae, 6–25 cm. longae, arcte convolutae vel explanatae et 1–2·5 mm. latae, rigidae, virides, supra prominenter nervosae et glabrae, subtus sparse pubescentes demum glabrescentes. *Spica* solitaria, gracilis, 5–18 cm. longa ; rhachis angulis minute scaberulis, internodiis plerumque 8–15 mm. longis. *Spiculae* subsessiles, alternatae, laxe dispositae, oblongae vel anguste oblongae, 10–20 mm. longae, 2·5–3·5 mm. latae, 6–16-florae, griseo-olivaceae. *Glumae* lanceolatae, acutae, uninerves, membranaceae ; inferior 5–6 mm. longa ; superior 6·5–8 mm. longa. *Lemmata* laxe imbricata, ovata, 4–6 mm. longa, firme membranacea, trinervia, minute bifida, e sinu aristam rectam scaberulam usque ad 4 mm. longam gerentia ; callus brevis, pilis albis usque ad 1·5 mm. longis dense barbatus. *Paleae* anguste ellipticae, acute bifidae, 4·5 mm. longae, carinis anguste alatis.

UGANDA : Bugishu ; Mt. Elgon, near Bulambuli, in short grass on rocks, 2400 m., *Snowden* 1187.

Tripogon Liebenbergii *C. E. Hubbard*, sp. nov., affinis *T. Mannii* Hook. f., sed glumis longioribus, lemmatibus longioribus acuminatis apice integris vel subintegris breviter aristatis differt.

Gramen perenne, dense caespitosum, usque ad 45 cm. altum. *Culmi* erecti vel leviter geniculati, teretes, gracillimi, simplices, 1–2-nodes, glabri laevesque. *Folia* plerumque basalia ; vaginae laeves, teretes, ore molliter barbatae, ceterum glabrae, basales persistentes, latae, pallidae ; ligulae ad seriem ciliorum minutorum redactae ; laminae angustissime lineares vel filiformes, subobtusae, erectae, usque ad 25 cm. longae, arcte convolutae vel explanatae et usque ad 2 mm. latae, marginibus scaberulis, ceterum glabrae

laevesque, rigidiusculae, virides, supra prominenter nervosae. *Spica* solitaria, gracilis, 12–17 cm. longa ; rhachis laevis, internodiis 8–15 mm. longis. *Spiculae* subsessiles, alternatae, oblongae, 9–12 mm. longae, 3 mm. latae, usque ad 8-florae, pallide virides. *Glumae* lanceolatae, acuminatae, uninerves, firme membranaceae ; inferior 6–8 mm. longa, carina scaberula ; superior 9 mm. longa, laevis. *Lemmata* arcte imbricata, ovata, acuminata, 6·5–7·5 mm. longa, firme membranacea, trinervia, carina apicem versus minute scaberula, apice hyalina integra vel subintegra in aristam scaberulam rectam gracillimam usque ad 4 mm. longam abeuntia ; callus brevis, pilis albis usque 2 mm. longis dense barbatus. *Paleae* elliptico-oblongae, obtusae, 4–4·5 mm. longae, tenuiter membranaceae, carinis late alatis.

UGANDA : Karamoja District ; from a moist spot near the top of Moroto Mtn., 2100 m., June 1930, *Liebenberg* 1805.

Enneapogon cenchroides (*Licht.*) *C. E. Hubbard*, comb. nov. *E. mollis* Lehm. Pugill. **3,** 40 (1831). *Pappophorum cenchroides* Licht. ex Roem. et Schult. Syst. Veg. **2,** 616 (1817).

Distrib. Tropical East Africa, Angola, South Africa, tropical Arabia, Punjab.

XIII—CONTRIBUTIONS TOWARDS A FLORA OF BRITISH NORTH BORNEO : IV.*

Ixora fulgida *Ridley*, sp. nov. [Rubiaceae] ; ab *I. fulgente* Roxb., cui affinis, foliorum nervis pluribus parallelis, corollae lobis ellipticis apice obtusis differt.

A *shrub*. *Leaves* linear-oblong to elliptic, rather abruptly acuminate, base narrowed, thinly coriaceous, polished, drying yellowish, 10–14 cm. long, 3–4 cm. wide, midrib raised on both sides, nerves 12 pairs, slender, horizontal, parallel, inarching at the tips ; petioles 5 mm. long ; stipules elongate-triangular, cuspidate, 4 mm. long. *Cyme* shortly peduncled, with short branches ; flowers about 20, crowded, sessile or subsessile. *Bracts* lanceolate, acute, 1 mm. long. *Calyx* urceolate, 2 mm. long, lobes 4, ovate, acute. *Corolla* red, tube slender, 4 cm. long, lobes 4, elliptic, obtuse, tips rounded, pubescent at the base, 12 mm. long, 5 mm. wide. *Anthers* linear, with long appendages, bases divaricate. *Style* exserted for 3 mm. ; stigmas short, bases thickened, not recurved, hardly 1 mm. long. *Berry* bilobed, 6 mm. in diameter. *Seeds* 2.

Sandakan, Port Myburgh, East Coast, Tanjong Batu, *Creagh* (type in Kew Herb.) ; Salinan, *Burbidge* ; Banguey, *Fraser* 221.

This is allied to *I. fulgens* Roxb., which also occurs in North Borneo, but the leaves in that species are considerably larger, with ascending, not parallel, nerves, and the petals are lanceolate, acute. In some specimens of *I. fulgida* Ridl. the leaves are broadly oblong or even ovate, but the nervation is similar to that of the narrow-leaved form.

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*Continued from *K.B.* 1933, 495.

Psychotria Fraseri *Ridley*, sp. nov. [Rubiaceae] ; a *P. crispipila* Merrill, cui affinis, foliis floribusque multo hirtioribus, floribus fructubusque multo minoribus differt.

A branching *shrub*, young parts densely red-hairy. *Leaves* subcoriaceous, glabrous except the midrib and nerves, elliptic, subacute, base obtuse, 5 to 7 cm. long, 1·5 to 2·5 cm. wide, midrib elevate above, densely red-hairy, nerves 8 pairs, elevate beneath, slender, hairy, secondary nerves few and very inconspicuous ; petioles 2 mm. long, densely hairy, stipules hairy, oblong, blunt, 3 mm. long. *Flowers* six, subumbellate on a densely hairy peduncle 2–3 mm. long ; pedicels 3 mm. long, densely hairy. *Calyx* saucer-shaped, lobes 4, ovate. *Corolla* 3 mm. long, tube thick, short, hairy, lobes 4, as long as tube, ovate. *Stamens* exserted, anthers small, elliptic. *Style* cylindric with a thickened stigma. *Drupe* obovoid-globose, glabrous, 5 mm. long. *Seeds* 2, inner surface flat, smooth, outer rounded ; albumen ruminate.

Sandakan, Kudat, *Fraser* 54.

The only species I can find at all near this is *P. crispipila* Merrill of the Philippines, but that is altogether larger and much less hairy.

Lasianthus sepalinus *Ridley*, sp. nov. [Rubiaceae] ; a *L. tomentoso* Bl., cui affinis, sepalis magnis oblongis obtusis, corolla parva differt.

Shrub ; branches pale, velvety. *Leaves* coriaceous, elliptic-lanceolate, cuspidate-acuminate, above glabrous, shining, beneath minutely papillose, bases cuneate, 13 to 16 cm. long, 4·5 to 6 cm. wide, midrib above slender, beneath thickened, elevate, hairy, nerves 5–6 pairs, elevate beneath, hairy, secondary nerves transverse, parallel and anastomosing, elevate beneath, hairy ; petioles 1 cm. long, hairy ; stipules short, ovate, hairy. *Flowers* sessile in dense axillary clusters, 9 mm. long. *Bracts* ovate, acute, hairy, 2 mm. long. *Calyx* campanulate, lobes 5, oblong, blunt, rounded at tip, 4 mm. long. *Corolla-tube* very short ; lobes 5, oblong, blunt, hairy outside, 5 mm. long. *Stamens* 5 ; anthers linear-oblong. *Style* rather short, stigmas linear, thick.

Bongaya, Labuk Bay, *Ridley* 9073 (type) ; Sandakan, *Mrs. M. S. Clemens* 9467 ; *Creagh.*

This species is very distinct from any of this group known to me in its unusually large blunt sepals and corolla with very short tube.

Ardisia Creaghii *Ridley*, sp. nov. [Myrsinaceae] ; ab *A. lanceolata* Roxb., cui affinis, foliis oblongo-ellipticis nervis parallelis, sepalis glabris brevioribus, stylo breviore, drupa majore differt.

A *shrub* or small tree ; branches terete. *Leaves* subcoriaceous, glabrous, drying red, oblong-elliptic, cuspidate, base shortly narrowed, decurrent halfway down the petiole, 9 to 13 cm. long, 4 to 5 cm. wide, beneath punctate, midrib strongly elevate beneath, nerves about 30 pairs, horizontal, parallel, secondary nerves few and indistinct ; petioles rather thick, winged halfway or nearly to base, 5 to 8 mm. long. *Panicle* terminal, dense-flowered, 7 cm. long,

branches 3 cm. long ; peduncles 2 to 3 cm. long. *Flowers* in short dense racemes, pedicels 5 mm. long. *Bracts* minute, amplexicaul, with a short point, caducous. *Sepals* oblong, rounded, coriaceous, glabrous, densely gland-dotted outside, 3 mm. long, 2 mm. wide. *Petals* ovate, acute, densely gland-dotted, 6 mm. long, 2 mm. wide. *Stamens* slightly shorter ; anthers lanceolate, acute, subcuspidate, with glands on the backs. *Style* short and thick. *Drupe* globose smooth, densely gland-dotted, 1 cm. long.

East Coast, Sandakan, Kabun China, *Creagh.*

Madhuca pubicalyx *Ridley*, sp. nov. [Sapotaceae] ; a *M. Kingiana* Ridl., cui affinis, foliis multo tenuioribus, pedicellis longis, floribus minus hirtis differt.

Tree. Leaves glabrous, branches glabrous, thinly coriaceous, oblanceolate, acuminate, base long and narrowed, 18–21 cm. long, 5·5–8·5 cm. wide, midrib sunk above, elevate beneath, nerves 18 pairs, elevate beneath, rather slender, inarching within the margin, secondary nerves few, transverse nervules few, anastomosing to form large reticulations : petioles 4 cm. long, bases thickened. *Flowers* numerous, 5 or 6 clustered together in the axils of fallen leaves. *Bracts* lanceolate, acute, pubescent, 2 mm. long. *Pedicels* slender, 3 cm. long, scabrid-pubescent. *Sepals* 4, oblong-ovate, outer pair coriaceous, pubescent, 9 mm. long, inner pair thinner, silky. *Corolla* : tube short, 2 mm. long, mouth hairy ; lobes 9, much longer, elliptic, blunt, 5 mm. long. *Stamens* 18 ; anthers lanceolate, acuminate, shorter than the corolla, apiculate, with long hairs on the tips. *Ovary* small, conic, hairy ; style glabrous, cylindric, 1·5 cm. long.

Sandakan, July 1896, *Creagh.*

Jasminum Gibbsiae *Ridley*, sp. nov. [Oleaceae] ; a *J. bifario* Wall., cui affine, caule scandente glabro, foliis rotundatis, calycis lobis longioribus subglabris, petalis multo longioribus et latioribus differt.

A woody *climber* with glabrous branches. *Leaves* glabrous, subcoriaceous, rotundate to ovate, blunt, base round, sometimes retuse, 4·5–6·5 cm. long, 4–6 cm. wide, nerves 2 or 3 pairs, elevate beneath, secondary nerves and reticulations invisible ; petioles 2 to 3 mm. long. *Flowers* in terminal dense cymes of about 12, with a few spathulate leaflike bracts 4 mm. long. *Bracteoles* linear, 2 mm. long, caducous. *Pedicels* puberulous, thick, 4 mm. long. *Calyx* campanulate, 2 mm. long, glabrous, lobes 6, setaceous, sparsely puberulous, 2 mm. long. *Corolla* : tube cylindric, 2·1 cm. long ; lobes 6, oblong, subacute, 1·4 cm. long, 4 mm. wide. *Stamens* 2 ; anthers linear, apiculate ; filaments short. *Style* longer, with a fusiform stigma.

Dent Province, Tenom. Liane, very general in secondary forest, with handsome white flowers, no scent, *Miss L. S. Gibbs* 2684.

This was referred to *J. bifarium* Wall. in Miss Gibbs's account, but that species is usually a bush, hardly scrambling, is much more pubescent on the twigs and calyx, and has flowers about half the size of the present plant.

Jasminum melastomifolium *Ridley*, sp. nov. [Oleaceae] ; a *J. dolichophyllo* Merrill, cui affine, foliis multo majoribus ellipticis, caule angulato, corollae lobis multo brevioribus differt.

A slender, climbing *shrub*, with glabrous, four-angled branches. *Leaves* glabrous, chartaceous, elliptic, acute, cuspidate, the cusp 1 to 1·5 cm. long, base obtuse or rounded, 13 to 14 cm. long, 5 cm. wide, primary nerves 2, running from the base to the apex 4 to 6 mm. from the margin, secondary nerves running from the midrib to the lateral nerves, slender, elevate beneath ; petioles twisted, 6 mm. long. *Panicle* terminal, few-flowered, with a slender peduncle 1·6 cm. long. branches few, very slender, four-angled, puberulous, 2 cm. long, *Flowers* 5, crowded at the apex of a branch ; pedicels very slender, 1·6 cm. long. *Calyx* campanulate, puberulous, 1 mm. long ; lobes 4, setaceous, pubescent, 3 mm. long. *Corolla* : tube 4 mm. long ; lobes lanceolate, acute, 5 mm. long.

Banguey Island, *Fraser* 225.

I have only seen one bud of the inflorescence of this remarkable species, notable for its very slender peduncle and pedicels.

Jasminum spectabile *Ridley*, sp. nov. [Oleaceae] ; a *J. crassifolio* Bl., cui affine, foliis chartaceis oblongo-lanceolatis, floribus multo majoribus, corollae lobis latioribus obtusis differt.

A scandent *shrub*, branches glabrous, terete, warted. Leaves glabrous, chartaceous, oblong-lanceolate, long-acuminate, base narrowed, blunt, 18 cm. long, 6 cm. wide, nerves 8 pairs, very slender, ascending, basal pair 9 cm. long, laterals shorter, secondary nerves few, undulate, forming large reticulations, midrib elevate beneath, sunk above ; petioles 2 cm. long. *Panicle* 15 cm. long ; peduncle 9·5 cm. long, terete ; branches few, 3 cm. long ; bracts very narrow, lanceolate, acuminate, 0·2 mm. long. *Calyx* campanulate, puberulous, 7 mm. long, teeth setiform, 1 mm. long. *Corolla* : tube slender, 1·5 cm. long ; lobes 5, broadly oblong, obovate, tips rounded, 2 cm. long, 1 cm. wide. *Stamens* 2 ; anthers large, oblong-linear, apiculate ; filaments linear, shorter. *Style* as long as stamen filaments ; stigma oblong-linear.

Without precise locality, *D. D. Wood* 1319.

This beautiful plant is noticeable for its large flowers with rounded corolla lobes. It appears to belong to the group of *J. crassifolium* Bl., from which it differs in its large thin lanceolate leaves.

Linociera pubicalyx *Ridley*, sp. nov. [Oleaceae] ; a *L. paludosa* King et Gamble, cui affinis, foliis minoribus laevibus, nervis inconspicuis, paniculis brevibus, floribus minoribus in capitulis sessilibus, petalis brevioribus crassis differt.

Tree or shrub, glabrous except the inflorescence. *Leaves* coriaceous, smooth, grey when dry, lanceolate or elliptic, cuspidate-acuminate, base narrowed, 8 to 13 cm. long, 3·5 to 4·7 cm. wide, nerves 6 pairs, very inconspicuous, midrib sunk above ; petioles channelled above,

0·5–1 cm. long. *Panicles* axillary and terminal, 1 to 3 together in an axil, pubescent, dense-flowered, 2 cm. long ; peduncles 0·3–1 cm. long, rather thick ; branches 3 or 4, bracts lanceolate-ovate, acute, pubescent, 1 mm. long. *Flowers* sessile, crowded at the tips. *Calyx* pubescent, 1 mm. long, lobes short, ovate, blunt. *Corolla-tube* as long as the calyx ; lobes linear, fleshy, blunt, edges involute, bases dilated, 2 mm. long. *Stamens* : anthers elliptic, connective rather broad, not prolonged. *Ovary* conic ; *style* short ; stigma capitate, obscurely lobed.

Gaya island, sea shore, *Haviland* 1442.

Melodinus lancifolius *Ridley*, sp. nov. [Apocynaceae] ; a *M. micrantha* Hook. fil., cui affinis, foliis tenuioribus lanceolatis, paniculis laxis longioribus, corollae lobis integris differt.

Climbing glabrous *shrub* ; branchlets rather slender, terete. *Leaves* thinly-coriaceous, shining above, lanceolate, acuminate, base shortly narrowed, 8·5–9·5 cm. long, 3–3·5 cm. wide, nerves 8 pairs, irregular, slender, anastomosing near the edge, midrib elevate beneath ; petioles 3–5 mm. long. *Panicles* axillary, 1·5–2 cm. long, lax, few-flowered ; branchlets distant, 5 mm. long, bracts ovate, acute, 1 mm. long. *Sepals* 4, ovate, blunt, edges ciliate. *Corolla-tube* dilate in the middle, with thick scales in the mouth, 2 mm. long ; lobes rounded, entire, 1 mm. long. *Stamens* 4, inserted below the mouth ; anthers lanceolate, acute, filaments short. *Ovary* 2-celled, conic ; style slender, stigma conical.

Kudat, *Fraser* 70.

Leoconotis Maingayi *Dyer* [Apocynaceae].

Sandakan, Myburgh Province, *Elmer* 20295. Also in Sarawak : Kuching, *Haviland* 909.

Parabarium micranthum *Pierre* [Apocynaceae].

Sandakan, East coast, *Creagh*.

Kopsia dasyrachis *Ridley*, sp. nov. [Apocynaceae] ; a *K. macrophylla* Hook. fil., cui affinis, foliorum nervis pluribus, petiolis longioribus, pedunculis multo longioribus, corollae tubo longiore, lobis minoribus differt.

A *tree*, 20 feet tall, with stem 6 inches through ; branchlets angled above. *Leaves* coriaceous, elliptic, acuminate, base narrowed, 16–21 cm. long, 7–9 cm. wide, midrib stout, flattened above, nerves 10 to 12 pairs, slender, elevate beneath, inarching within the margins ; petioles 1 cm. long, channelled. *Peduncle* terminal, 4–7 cm. long. *Racemes* 4, pubescent, growing to 9 cm. long. *Bracts* ovate, acute, keeled, pubescent, 1 mm. long. *Flowers* white, sessile or shortly pedicelled. *Sepals* lanceolate-oblong, subobtuse, pubescent, 1 mm. long. *Corolla-tube* slender, 2·5 cm. long, dilated for 3 mm. below the mouth ; lobes rotundate-ovate, 1·5 cm. long, 5 mm. wide. *Stamens* 5 ; anthers subsessile, narrowly sagitate, acuminate,

2 mm. long. *Glands* 2, linear, as long as the ovary. *Carpels* hairy above ; style slender ; stigma cylindric.

D. D. Wood 1315, without precise locality. Batu Putih, Tambisan, *Creagh.* Forests, Lukan, *Arsat* 1211 (type).

Gaertnera brevistylis *Ridley*, sp. nov. [Loganiaceae] ; a *G. acuminatae* Hook. fil., cui affinis, foliis coriaceis majoribus, floribus multo minoribus, stylo brevissime differt.

A stout woody *shrub* with glabrous branches. *Leaves* glabrous, coriaceous, greenish when dry, lanceolate-oblong or oblong, cuspidate-acuminate, base shortly cuneate, 15–17 cm. long, 4–7·2 cm. wide, nerves 7–10 pairs, slender, secondary nerves slender, inconspicuous ; petioles 0·4-1 cm. long ; stipules connate in a cylindric tube, 0·5–1 cm. long, teeth 2, setiform. *Panicle* shorter than the leaves, mealy-pubescent, 6–7 cm. long, dense, many-flowered, main branches 3, spreading, 5 cm. long ; bracts foliaceous, lanceolate, acuminate, 3–5 cm. long, 5 mm. wide ; ultimate branchlets 5–7 mm. long. *Flowers* sessile, small ; lower bracteoles lanceolate, acuminate, with a few processes on the margin, upper ones ovate. *Calyx* campanulate, puberulous, 1 mm. long ; teeth 5. *Corolla* 3 mm. long, tube very short, white hairy inside at the base of the stamens ; lobes 5, much longer, oblong, blunt. *Stamens* 5 ; anthers oblong, blunt fuscous. *Style* 1 mm. long ; stigmas longer, lanceolate, blunt, pubescent.

Sandakan, *Creagh* (type) ; Balambangan island, *Wood* 7651.

Very distinct in its stout woody stems, large leaves and dense panicles of small flowers. The corolla tube is very short and the stigmatic lobes actually longer than the style. This is apparently the plant to which Merrill (Journ. S. S. Br. Roy. As. Soc. Special Number, 580) gives the name *Gaertnera vaginans* nov. comb. (*G. Koenigii* Wt., *Psychotria vaginans* DC.), but DeCandolle's plant is the Ceylon one, endemic there.

XIV—CONTRIBUTIONS TO THE FLORA OF TROPICAL AMERICA : XIX.* N. Y. Sandwith.

Eugenia aeruginea DC., a misidentified type specimen.

"*Eugenia? aeruginea*" DC. belongs to a group of West Indian species with a well-developed racemose inflorescence. It was described by de Candolle, Prodr. **3,** 283 (1828), from a specimen labelled *Myrtus aeruginea* which had been in Herb. Forsyth and had reached Herb. L'Héritier. Apart from the word "Forsyth" there was no indication of the collector or origin of the specimen and de Candolle accordingly described the locality as "in America calid." When Berg monographed the American *Myrtaceae* he merely repeated this evidence without either transcribing or elaborating the description, see Linnaea, **27,** 290 (1855). Grisebach, Fl.

*Continued from K.B. 1933, 497.

Brit. W. Indies, 237 (1860), gave an original description based on material from Dominica, collected by Imray, and from Cuba ; and he definitely assigned the type locality to Jamaica, although he apparently did not see the type specimen, or at any rate did not use it in making up his description. The bracteoles of *E. aeruginea* were described by Grisebach as roundish, and it is clear from this and from the evidence of the Imray specimen at Kew that he was applying the name *E. aeruginea* to a species with conspicuous, roundish, connate bracteoles which occurs plentifully in Cuba, Porto Rico and Santo Domingo, and extends to Dominica and to Trinidad. This plant had been described as *E. domingensis* by Berg in Linnaea, **27,** 296 (1855) and divided by him into two varieties in Linnaea, **29,** 244–245 (1857).

The next mention of *E. aeruginea* is in a paper on West Indian *Myrtaceae* by Kiaerskou in Bot. Tidsskr. **17,** 257 (1890) in which the author identified a Porto Rico specimen, collected by Stahl, as this species. In this paper *E. domingensis* is also mentioned, and several specimens are cited from Porto Rico, Santo Domingo and Dominica. Finally we come to Urban's valuable monograph of the West Indian *Myrtaceae* in Engl. Bot. Jahrb. **19,** (1895). Urban accepted Grisebach's interpretation of *E. aeruginea* and applied the name to the common species with roundish, connate bracteoles which had been described by Berg as *E. domingensis*. It was clear from his note of exclamation that Urban had seen de Candolle's type, and his interpretation of the species has therefore naturally been accepted by subsequent writers on the West Indian Flora (Fawcett and Rendle, Fl. Jam. **5,** pt. 3, p. 337 ; Britton and Wilson, Sci. Survey of Porto Rico and the Virgin Islands, **6,** pt. 1, p. 34) and by himself in his Floras of Porto Rico and Santo Domingo (Symb. Antill. **4,** 446 ; **8,** 484). The Jamaican locality, given by Grisebach, has always been repeated with doubt, and Fawcett and Rendle excluded the species. Meanwhile Urban described a new species, *E. Fadyenii* Krug et Urb., from Jamaica and Cuba, which was easily distinguished from his *E. aeruginea* (*E. domingensis*) by the narrow, inconspicuous, free bracteoles, and by the number of ovules in each loculus. This plant was the *E. chrysophylloides* Macfadyen, Jam. **2,** 124 (1850) non DC., and the *E. Gregii* Griseb. Fl. 238, non DC., as to the Jamaican material, identifications which were verified and accepted by Fawcett and Rendle who accordingly adopted the name *E. Fadyenii* for the Jamaican plant with narrow free bracteoles.

Recent work on the *Myrtaceae* of Trinidad and Tobago has necessitated an examination of the type specimen of *E. aeruginea* DC., which has been kindly lent from the de Candolle Herbarium at Geneva. It came as a surprise to discover that the specimen has the bracteoles of *E. Fadyenii* Krug et Urb. and agrees perfectly with the Jamaican and Cuban material of that species. Urban may probably be excused for his misidentification since his ticket marked " vidit I. Urban, iv. 1894 " is placed in a separate paper

packet containing only two leaves and some detached buds ; the inference is that this is all that Urban saw, and that the rest of the material (which is in good condition) was not lent to him. On returning to the Kew material of *E. Fadyenii* from Jamaica, an old sheet from Herb. Benth. was discovered labelled : " Myrtus aeruginosa " (in Bentham's handwriting) ; Jamaica, Dr. Wright ; Herb. Forsyth, purchased 1835. This had been correctly determined as *E. Fadyenii* by Fawcett and Rendle. The specimen agrees so completely with de Candolle's type of *E. aeruginea* that there can be no doubt that it is part of the type collection. The mystery of the origin of the type specimen is thus solved : it was collected in Jamaica by Dr. Wright. It may be assumed that it was this Kew sheet which was seen by Grisebach and which led him to record *E. aeruginea* from Jamaica, although, as has been already mentioned, his description was based on material of *E. domingensis* Berg. The latter name should now be used, pending a revision of the whole genus, for the species with roundish, connate bracteoles which has been known for so long as *E. aeruginea* ; while *E. Fadyenii* Krug et Urb. should disappear into synonymy.

It may be mentioned, finally, that Urban cited under *E. domingensis* (*E. aeruginea* Urb.) a specimen collected by Anderson on St. Vincent which proves to represent a quite distinct species occurring also in Trinidad. This differs from *E. domingensis* in its leaves, which have elevated dots on the upper surface and the lateral nerves anastomosing far from the margin, in the reticulation which is prominulous and intricate on the upper surface, and in the free bracteoles which are otherwise similar in shape. This species will be described as new in the account of *Myrtaceae* in a future part of the " Flora of Trinidad and Tobago."

XV—GRAMINEAE AUSTRALIENSES : I. C. E. Hubbard. A New Genus from Southern Queensland.

Homopholis *C. E. Hubbard*, gen. nov. ; affinis *Leptolomati* Chase, sed gluma inferiore spiculae aequilonga vel paulo breviore arcte 7-nervi, anthoecio supero infero multo breviore, lemmate superiore apice calloso differt.

Spiculae similes, dorso anguste lanceolatae vel lineari-lanceolatae, acutae, muticae, dorso compressae, abaxiales, solitariae, longe pedicellatae, demum totae a pedicellis persistentibus disarticulatae, in ramis longis gracillimis paniculae ortae. *Anthoecia* duo ; inferum sterile, ad lemma et paleam minutam redactum ; superum ♀, infero multo brevius. *Glumae* similes, spiculae aequilongae vel inferior vel ambae paulo breviores, explanatae lineari- vel anguste oblongo-lanceolatae, obtusae, crebre et prominenter 7-nerves, herbaceae, marginibus angustis hyalinis ; inferior dorso plana ; superior leviter convexa. *Anthoecium inferum* : lemma spiculae aequilongum vel paulo brevius, ambitu anguste lanceolatum, subacuminatum, marginibus superne involutis, apice obtusum, dorso

planum, explanatum gluma superiori simile; palea minuta, biloba, hyalina. *Anthoecium superum* anguste elliptico-oblongum, subapiculatum : lemma explanatum late ellipticum, apice callosum, tenuiter 5–7-nerve, laeve, chartaceum, marginibus latis tenuibus planis ; palea lemmati aequilonga, acuta, dorso plana, 2-nervis, marginibus latis inflexis. *Lodiculae* duae, minutissimae. *Stamina* tria ; antherae lineares. *Ovarium* glabrum ; styli distincti, terminales ; stigmata plumosa, ex apice anthoecii exserta. *Caryopsis* anguste ellipsoidea, inter lemma et paleam arcte inclusa ; scutellum circiter dimidiam partem caryopsis aequans ; hilum basale.— Gramen perenne, laxe caespitosum ; culmi multinodes ; laminae lineares, planae ; ligulae tenuiter membranaceae ; panicula laxissima ; rami longi, plerumque applanati, superne 3–1-spiculati ; pedicelli solitarii ; spiculae fere glabrae.

Species unica, Queenslandiae incola.

H. Belsonii *C. E. Hubbard*, sp. nov. *Culmi* erecti vel plerumque geniculato-adscendentes, nonnunquam e basi prostrata et e nodis inferioribus radicantes, usque ad 40 cm. alti, gracillimi, teretes, basin versus laxe ramosi, rigidiusculi, usque ad 9-nodes, straminei, glabri laevesque. *Folia* glabra ; vaginae plerumque internodiis longiores, teretes, arcte appressae vel demum laxae, laeves ; ligulae truncatae, usque ad 1·5 mm. longae ; laminae basi leviter contractae, acutae, usque ad 8 cm. longae, plerumque 2–2·5 mm. latae, subglaucae, minute scaberulae. *Panicula* valde effusa, ambitu latissime obovata vel demum latissime elliptica, demum a culmo disarticulata, usque ad 25 cm. longa et 20 cm. lata ; axis primarius gracillimus, strictus, angulatus et leviter sulcatus, minute scaberulus ; rami numerosi, stricti, rigidiusculi, oblique patentes, demum horizontaliter patentes vel leviter deflexi, solitarii vel 2–3-approximati, applanati vel subtriquetri, marginibus scabridis, basi in axillis minute pubescentes, inferiores usque ad 15 cm. longi, superiores gradatim breviores ; pedicelli ramis similes, 1·3–6 cm. longi, apice subdiscoidei. *Spiculae* 4·5–6 mm. longae, atrovirides. *Gluma* inferior basi serie pilorum minutissimorum praedita, nervis scaberulis ; gluma superior inter nervos pilis minutissimis rigidis instructa ; internodium rhachillae inter glumas usque ad 0·5 mm. longum. *Lemma* anthoecii inferi fere glabrum ; palea circiter 0·5 mm. longa. *Lemma* anthoecii superi usque ad 3 mm. longum. *Antherae* 1·5 mm. longae. *Caryopsis* 2 mm. longa.

Queensland : Darling Downs District ; head of Dogwood Creek, east of Gurulmundi, Nov. 1930, *Belson*.

This new genus belongs to the section of Panicoid genera which Stapf has grouped together as the *Digitariastrae*. They are characterised by the relatively thin wide flattened margins of the lemma of the upper floret, which in the young floret almost meet across the back of the palea ; the lemma and palea are also thinner in texture than in the *Panicastrae*. The much-reduced palea of the lower floret frequently remains attached to the base of the upper floret as

in *Digitaria*. There seems no doubt that *Homopholis* is most closely allied to *Leptoloma* Chase, a genus represented in North America by *L. cognatum* Chase and in Northern Australia by *L. papposum* Hughes. *Leptoloma cognatum* and *Homopholis Belsonii* are very similar in general appearance but the well-developed lower glume and comparatively small fertile floret of the latter enable them to be readily distinguished. The same characters serve to separate *Homopholis* from *Digitaria* Hall. and *Chloridion* Stapf; whilst from these and other members of the *Digitariastrae* it also differs in its paniculate inflorescence.

XVI—MISCELLANEOUS NOTES.

The Director.—The Director has been elected a Corresponding Member of the Botanical Society of New York, and an Honorary Member of the Pennsylvania Horticultural Society. The latter society is the oldest of its kind in America, having been founded in 1827.

Mr. R. O. Williams.—Mr. Williams, who was a student at Kew until 1916, and has been Economic Botanist at Trinidad since 1932, has been appointed Assistant Director of Agriculture in that colony.

Dukinfield Henry Scott.—The late Dr. D. H. Scott, M.A., Ph.D., D.Sc., F.R.S., Hon. Keeper of the Jodrell Laboratory from 1892 to 1906, whose death on January 29th, 1934, was recorded in the last number of the "Kew Bulletin," was closely associated with Kew from early in the year 1882 until he moved his home from The Old Palace, Richmond, to East Oakley House, Basingstoke, in the autumn of 1906.

Scott was educated privately and went up to Christ Church, Oxford, taking his degree in 1876. One of his achievements while at Oxford was the catching of a very large pike, which was for a long time preserved and hung in his rooms! He then studied engineering until the end of the year 1879, working at the King's Cross Engine Works, but he continued to keep up his interest in botany which he had commenced to study on his mother's advice in 1868. His love of locomotives never left him and the sight of a fine express train always gave him pleasure. Characteristically he deplored the advent of the electric train and the disappearance of the engine, he, himself, on one occasion at least, having driven one. In the autumn of 1879 he began to think seriously of returning to botany and was given an introduction to Sir Joseph Hooker from Fletcher Moulton. This brought him in contact with Thiselton-Dyer, who advised him to go and work in Germany, and also with S. H. Vines who was then a nascent influence at Cambridge. Thus came about his visit to Sach's Laboratory at Würzburg. For this he then made active preparation by learning German—which he accomplished in three months—and in February 1880 he went to Würzburg.

Sach's Laboratory at that time was the Mecca to which so many young British botanists were attracted and in which they so greatly benefited from the inspiration and guidance of the famous professor. Here Scott commenced his work on articulated laticiferous vessels, working under Sachs and also under Goebel, who was then his assistant, and gained the degree of Ph.D. in the university on these studies.

During July and August 1882 Scott returned to Würzburg, where Walter Gardiner was working on the continuity of protoplasm.

On his return to England, he came to work in the Jodrell Laboratory where F. O. Bower and Walter Gardiner were then engaged in botanical research, and all three worked in the room now occupied by the Assistant Keeper of the Laboratory. Scott continued his researches on laticiferous tissues on which he had been engaged at Würzburg, and the results were published in three papers dealing with the laticiferous vessels in *Hevea* (1) *Manihot Glaziovii* (2) and in the leaf (3). He used to ride to Kew from Wimbledon every morning and go back in the afternoon, riding across the Common and Richmond Park and then along " Sandy Lane," now Sandycombe Road, to Kew, stabling his horse close to Newens' shop in the Kew Road. It was during this and the following year that Scott co-operated with Bower in completing the translation of De Bary's " Comparative Anatomy of the Phanerogams and Ferns "—already partly accomplished by Bower—which was published by the Clarendon Press in 1884. Shortly after his return home in 1882, he succeeded Bower at University College, London, as Assistant Professor of Botany under Professor Daniel Oliver, and then, in 1885, when Bower was appointed Regius Professor of Botany in Glasgow University, Scott followed Bower and took his place as Assistant Professor of Botany at the Royal College of Science, Huxley being at first still Professor of Biology (including both botany and zoology). This post he held until 1892, but feeling a desire for freedom to devote more time to botanical research than was possible with his professorial duties, he resigned his professorship at the college and accepted the post of Honorary Keeper of the Jodrell Laboratory—a post which was specially created for him and one to which he quickly brought great distinction.

While he was at the Royal College of Science, during the year 1886, he was working from time to time in the Jodrell Laboratory, as he had obtained permission from the Director for a few of his students at the college to carry on botanical investigations in the laboratory under his supervision. One of these students, Miss H. V. Klaassen, was working under his direction on the blue-green algae, and his paper " On Nuclei in *Oscillaria* and *Tolypothrix* " (4) was one of the results of the investigation. The other was his engagement to Miss Klaassen during the progress of the work in the Jodrell, followed by their marriage in 1887, a very happy union which was so sadly terminated by Mrs. Scott's death in 1929.

From 1892 until 1906 he was Honorary Keeper of the Laboratory and his time during these fruitful years was mainly devoted to his palaeobotanical researches which have made his name famous throughout the world.

Almost simultaneously with Scott's assumption of the Keepership of the Jodrell Laboratory he became associated with the late Professor Williamson, of the then "Owen's College," Manchester, in the study of the fossil plants of the coal measures. Williamson was then the leading authority on this subject and Scott worked in close collaboration with him until the former's death in 1895.

During his time at Kew he carried out the official duties connected with the post and was always ready to give advice and offer friendly criticisms to other research workers in the Laboratory whenever his help might be sought.

Scott for a time employed his own private assistant, the first at Kew being Mr. W. C. Worsdell, who was one of his students at the Royal College. Mr. G. T. Gwilliam followed Worsdell and many of his drawings are to be found in Scott's books and papers on fossil botany. Mr. L. A. Boodle, also a former student and a demonstrator at the college, was another of his assistants and eventually succeeded him as Assistant Keeper of the Laboratory.

The time of Scott's keepership was remarkable for the output of original work both by himself and by other visiting botanists. Among these may be mentioned Gwynne Vaughan (*Nymphaeaceae* and Ferns), Lang (Cycads), Brebner, who was formerly Scott's assistant (Ferns, etc.), Worsdell (Cycads & Conifers), while at the same time Horace Brown and Escombe were carrying out their important research in plant physiology in the Laboratory. It was a period of great activity and thanks to Scott's work and presence the Jodrell became a centre to which many eminent British and foreign botanists were constantly attracted.

The numerous important papers published by Scott while he was at Kew are enumerated below (p. 132). The earlier ones deal mainly with the anatomical structure of living plants, but as time went on his interest turned to the structure of fossil plants and more especially those of the carboniferous period, on which he became the chief authority. It was his studies of sections of coal balls, it will be remembered, which yielded results of so great importance with regard to the Pteridosperms. His well-known book on fossil plants was published while he was working at the Laboratory and also his two admirable text books, "An Introduction to Structural Botany (Parts I and II)," perhaps the best books of their kind which have been written for British students.

Scott was elected a Fellow of the Royal Society in 1894 and was Foreign Secretary from 1912–1916. In 1906 he was awarded a Royal Medal, and in 1926 the Darwin Medal was most appropriately conferred upon him by the society.

He was elected a Fellow of the Linnean Society in 1880 and served on the Council on many occasions. From 1902 to 1908 he filled the

office of Botanical Secretary and was President of the Society from 1908 to 1912. In 1921 he was awarded the Linnean Medal. Scott was also a past President of the Royal Microscopical Society, from which he received the Wollaston Medal in 1928. On two occasions, in 1896 and again in 1921, he was President of the Botanical Section of the British Association. These are only some of his many scientific activities; nor have we enumerated the many distinctions conferred upon him by universities and scientific academies both at home and abroad, all of which were as greatly honoured by the inclusion of Scott's name in their list of membership as was he by their recognition of his outstanding merits.

On February 29th, 1908, Scott's portrait, which had been painted by Mr. R. Kerr-Lawson, was handed over to the Director by Prof. F. W. Oliver and now hangs in the room in the Laboratory where he carried out his researches. The presentation formed the occasion of a very pleasant gathering of Scott's former colleagues and his many botanical friends.

Scott continued his palaeobotanical researches after his retirement from Kew with unabated vigour for many years, and latterly more especially he extended his already wide knowledge of field botany, using his walks and excursions as a means of becoming familiar with the flora of his county, Hampshire.

Scott, alas, has passed from us, but has left behind him a goodly heritage, abiding work so that others may truly enter into his labours. His logical mind, combined with his habits of painstaking thoroughness, his caution and scientific procedure, made him a pre-eminent research-worker, and his lucid style of writing added to the value of his published work.

His interest in all kinds of botanical research, his unfailing kindness to younger research-workers, and his readiness to give them help in the way of discussion and advice, were widely appreciated by those who worked in the Laboratory during his keepership.

Scott's long connection with " The Annals of Botany " from 1893 deserves honourable mention in any record of his valuable services to botany. Not only was he Chairman of the Committee for many years until his death, but his extensive knowledge of plant anatomy and especially of palaeobotany was always placed at the service of his colleagues.

We cannot better conclude this note than by quoting what his old colleague, Sir John Farmer, wrote to " The Times " on February 3rd :

" Scott was not only a scientific man of universally recognised eminence, but he was also an ' influence.' Very tenacious of well-considered views, he was nevertheless by no means an obstructive critic, and there are many of his colleagues who will recall discussions, never acrimonious but always well informed and helpful, on those branches of the science which he had made specially his own. His name is assured of a permanent and honoured position in the

literature of his subject, and his memory as a man will ever be affectionately cherished by those who enjoyed the privilege of his friendship." A. W. H.

List of the more Important Papers by Dr. D. H. Scott between the Years 1884 and 1907.

1. On the Laticiferous Tissue of *Manihot Glaziovii* (the Ceara Rubber). *Quart. Journ. Microsc. Sc.* **24,** new series, 193–206, 1 pl. (1884).

2. On the Occurrence of Articulated Laticiferous Vessels in *Hevea*. *Journ. Linn. Soc., Bot.* **21,** 566–573 (1885).

3. On Nuclei in *Oscillaria* and *Tolypothrix*. *Journ. Linn. Soc Bot.* **24,** 188–192, 1 pl., 4 figs. (1887).

4. (with H. W. T. Wager) On the Floating Roots of *Sesbania aculeata* Pers. *Ann. Bot.* **1,** 307–314 (1888).

5. Distribution of Laticiferous Tissue in the Leaf. *Ann. Bot.* **3,** 445–446 (1889).

6. (with G. Brebner) On the Secondary Tissues in certain Monocotyledons. *Ann. Bot.* **7,** 21–62, 3 pls. (1893).

7. (with E. Sargant) On the Pitchers of *Dischidia Rafflesiana* Wall. *Ann. Bot.* **7,** 243–269, 2 pls. (1893).

8. On *Cheirostrobus*, a New Type of Fossil Cone from the Calciferous Sandstone. *Proc. Roy. Soc.* **60,** 416–424 (1896).

9. On Two New Instances of Spinous Roots. *Ann. Bot.* **11,** 327–332, 2 pls. (1897).

10. The Anatomical Characters presented by the Peduncle of *Cycadaceae*. *Ann. Bot.* **11,** 399–419, 2 pls. (1897).

11. The Structure and Affinities of Fossil Plants from the Palaeozoic Rocks.

I. On *Cheirostrobus*, a New Type of Fossil Cone from the Lower Carboniferous Strata (Calciferous Sandstone Series). *Phil. Trans. Roy. Soc.* ser. B. **189,** 1–34, pls. 1–6 (1897).

II. On *Spencerites*, a New Genus of Lycopodiaceous Cone from the Coal Measures, founded on the *Lepidodendron Spenceri* of Williamson. *Phil. Trans. Roy. Soc.* series B. **189,** 83–106, pls. 12–15 (1897).

III. On *Medulosa anglica*, a New Representative of the Cycadofilices. *Phil. Trans. Roy. Soc.* series B. **191,** 81–126 (1899).

12. Note on the Occurrence of a Seed-like Fructification in certain Palaeozoic Lycopods. *Proc. Roy. Soc.* **67,** 306–309 (1900).

13. (with T. G. Hill) The Structure of *Isoetes hystrix*. *Ann. Bot.* **14,** 413–454, 2 pls., 2 figs. (1900).

14. On a Primitive Type of Structure in *Calamites*. *Ann. Bot.* **15,** 773–774 (1901).

15. The Structure and Affinities of Fossil Plants from the Palaeozoic Rocks. IV. The Seed-like Fructification of *Lepidocarpon*, a Genus of Lycopodiaceous Cones from the Carboniferous Formation. *Phil. Trans. Roy. Soc.* ser. B. **194,** 291–333, pls. 38–43 (1901).

16. On the Primary Structure of certain Palaeozoic Stems, with the *Dadoxylon* Type of Wood. *Trans. Roy Soc. Edinb.* **40,** 331–365, pls. 1–6, 5 figs. (1902).

17. The Origin of Seed-Bearing Plants. Lecture delivered at Royal Institution of Great Britain. Evening Meeting, Friday, May 15th, 1903.

18. Germinating Spores in a Fossil Fern Sporangium. *New Phyt.* **3,** 18–23 (1904).

19. (with F. W. Oliver) On the Structure of the Palaeozoic Seed *Lagenostoma Lomaxi*, with a Statement of the Evidence on which it is referred to *Lyginodendron*. *Phil. Trans. Roy. Soc.* ser. B. **197,** 193–247, pls. 4–10 (1904).

20. What were the Carboniferous Ferns? *Journ. Roy. Micro. Soc.* 1905, 137–149, pls. 1–3, 2 figs. (Presidential Address for 1905.)

21. The Early History of Seed-bearing Plants, as recorded in the Carboniferous Flora. (The Wilde Lecture.) *Mem. and Proc. Manchester Lit. and Phil. Soc.* **49,** 1–32, 3 pls. (1905).

22. The Sporangia of *Stauropteris Oldhamia* Binney (*Rachiopteris Oldhamia* Will.). *New Phyt.* **4,** 114–120 (1905).

23. The Structure and Affinities of Plants from Palaeozoic Rocks. V. On a New Type of Sphenophyllaceous Cone (*Sphenophyllum fertile*) from the lower coal measures. *Phil. Trans. Roy. Soc.* ser. B. **198,** 17–39, pl. 3–5 (1905).

24. (with A. J. Maslen) Note on the Structure of *Trigonocarpon olivaeforme*. *Ann. Bot.* **20,** 109–112 (1906).

25. The Structure of *Lepidodendron obovatum* Sternb. *Ann. Bot.* **20,** 317–319 (1906).

26. The Occurrence of Germinating Spores in *Stauropteris oldhamia*. *New. Phyt.* **5,** 170–172, 2 figs. (1906).

27. The Present Position of Palaeozoic Botany. *Progressus Rei Botanicae,* **1,** 139–217 (1906).

28. The Fern-like Seed Plants of the Carboniferous Flora. Ueber die wichtigsten neueren Ergebnisse der Phytopaläontologie. Resultats scientific. du Congrès internat. de Bot. Wien, 1905. Jena, 1906. Pp. 279–296, 17 figs.

29. On *Sutcliffia insignis*, a New Type of *Medulloseae* from the Lower Coal Measures. *Trans. Linn. Soc. Bot.* **7,** 45–68, pls. 7–10 (1906).

30. (with A. J. Maslen) The Structure of Palaeozoic Seeds, *Trigonocarpus Parkinsoni* Brongniart, and *Trigonocarpus Oliveri* sp. nov. Part I. *Ann. Bot.* **21,** 89–134, 4 pls. (1907).

It may be of interest to mention that the last written record concerning Dr. Scott in the manuscript list of workers at the Jodrell reads as follows :—" November 1909. Dr. Scott worked in the laboratory for a fortnight, getting drawings made of some Devonian plants ; also two days on *Poroxylon* with Maslen."

Sidney Howard Vines.—On Wednesday, April 8, there died at Exmouth, aged 84, Dr. S. H. Vines, F.R.S., Emeritus Professor of Botany at Oxford from 1888 to 1919. He never worked continuously at Kew, and the younger generation hardly knew him : but his early contact with Kew was bound up with the initial steps in that revolution in the teaching of botany in Great Britain which led to the better conditions as we now enjoy. Though in an earlier period plant-anatomy and physiology were pursued with conspicuous success in Britain, at the middle of the 19th century interest had drifted almost exclusively into systematic channels, probably as a consequence of the development of the Empire, and a need for ascertaining its resources. In the universities the more vital studies were virtually dead : but in their revival 60 years ago Vines took a very notable share. The initiative came from Huxley, who with Burden Sanderson, Michael Foster, and Thiselton-Dyer started the first practical courses in elementary biology at South Kensington, extending from 1871 onwards. This led later to separate courses of instruction in zoology and in botany. The latter fell into the hands of Thiselton-Dyer, and his first course was held in the summer of 1875. Vines, who had already entered as a medical student at Guy's Hospital, had attracted the attention of Dyer as a competent physiologist, and he was asked to co-operate with him. They stayed together at Kew, carrying out preparatory work for the course ; and thus indirectly the first laboratory teaching in the subject was organised at Kew.

The stimulus towards a biological rather than a merely systematic teaching of the science thus emanated from Kew. It was through Vines that the method and spirit of the movement was conveyed to Cambridge where he had already entered Christ's College as a scholar. The writer of these lines, who entered at Trinity in 1874, can witness to the sterility that reigned there botanically. It is true that Henslow, who held the chair till 1860, had stimulated observation and experiment in his pupils. But under Babington, who followed him, the work in the Department of Botany, as specified in the Calendar of 1876, consisted only in " An elementary course of Lectures, chiefly on Descriptive Botany, given during the Easter Term " : while " the Professor makes herborizing excursions with his class, should circumstances permit." This was all that was offered. With the countenance and aid of Michael Foster, Vines initiated practical courses in Botany, of the South Kensington type, held in the physiological laboratory. An enthusiastic group of undergraduates at once gathered round him : we endeavoured to verify for ourselves the developmental details embodied in the text-book of Sachs, an English edition of which had appeared in 1875. There may have been similar efforts elsewhere : perhaps at Oxford under Lawson, and particularly in Edinburgh under Hutton Balfour. But it was in Cambridge and at South Kensington that what was then called " the New Botany " caught hold : and it was largely due to the influence of Dyer and of Vines.

There is no need here to recite again the further course of Vines' career, for it has been fully described elsewhere. We shall remember how he laboured as Reader in Botany in Cambridge till 1888, when he was appointed to the chair in Oxford, and held it for over 30 years. How as a co-editor from 1887 to 1899 he bore a full share in raising the Annals of Botany to the position of a leading scientific journal: and how he presided over the Linnaean Society in 1904, and the usual term of following years. For all this he deserves our gratitude. The special point of this note is rather to show how he shared in the revival in Britain of botany as a living cult: taking his initiative from South Kensington and from Kew: and particularly how he established it firmly in the early years of the movement at Cambridge. F. O. BOWER.

Erwin Baur.—We learn with regret of the death of Professor Erwin Baur at the relatively early age of 58.

Baur took his degree of doctor of medicine in 1900 and in 1903 received the degree of Doctor of Philosophy for a thesis on the development of the apothecia in lichens. He became Professor and Director of the Botanical Institute of the Königliche Landwirtschaftliche Hochschule, Berlin, in 1911. From that date he specialized in plant genetics and its applications, and founded an Institut für Vererbungslehre in Berlin-Dahlem in 1922 and the Kaiser Wilhelm Institut fur Züchtungsforschung at Müncheberg in 1929.

Baur's most extensive research was in the genus *Antirrhinum*. He studied genetically the large series of colours and other mutational characters in the garden snapdragons. Later he collected wild species of the genus in Spain and other countries and with the help of colleagues investigated their behaviour under controlled crossing and selfing and with varying laboratory conditions (X-ray, light, and chemical treatments). A set of his specimens was presented to Kew and is preserved in the Herbarium, and a very interesting series of mutational forms has been grown in the Gardens and sets of herbarium specimens made from them. Other investigations were carried out under Baur's direction on cereals, lupins, tobacco, vines, potatoes, and other important economic plants.

Amongst his many other activities he founded the "Zeitschrift für induktive Abstammungs- und Vererbungslehre," "Bibliotheca Genetica," and "Der Züchter."

Baur gave the Masters Lectures in 1931 (see Journ. Roy. Hort. Soc. **56**, 176, 183: 1931). He was elected a foreign member of the Linnean Society in 1933. W. B. TURRILL.

Wild Birds.—A short time ago a snipe was observed at the southern end of the Gardens. As far as we can ascertain this is the first record for this bird at Kew. About the same time a woodcock was noted on several occasions, and kingfishers are fairly regularly to be seen, both by the islands on the lake and more rarely near the

pond and water garden. Another interesting bird at present in the Gardens is a silvery-white hen blackbird, which can be seen any day in the grounds of the Queen's Cottage.

An account of the wild flora and fauna of Kew (Birds by W. H. Hudson) was published in 1906 (Kew Bulletin, Additional Series V. Price 2*s.*, obtainable from the Director), and additional records have been recorded from time to time in subsequent numbers of the Bulletin. The Director is always glad to receive new records of the wild life of the Gardens for publication in subsequent lists.

The validation of new combinations by indirect citation of the synonyms concerned.—Six new combinations under *Cymbopogon* for species placed under *Andropogon* in Steudel, Syn. Pl. Glum. **1,** 387, 388 (1855), were published by the late Dr. W. Watson in Atkinson's Gazetteer of the North-Western Provinces of India, 392 (1882). Being unaccompanied by their respective synonyms, they were overlooked during the preparation of the "Index Kewensis," and have just come to light. Consequently some of them have been published again independently by later authors. The combinations concerned are the following:—*Cymbopogon distans, C. flexuosus, C. Martini, C. pachnodes, C. pendulus* and *C. versicolor.* At first sight they might be taken for *nomina nuda,* but each is followed by its running number under *Andropogon* in Steudel's Syn. Pl. Glum., which gives the name on which it is based. Thus "*Cymbopogon distans* 298" means *Andropogon* No. 298 of Steudel, *i.e., A. distans* Nees ex Steud. Syn. Pl. Glum. **1,** 387 (1855).

Eight new combinations under *Chrysopogon,* two each under *Batratherum* and *Ischaemum,* and one each under *Apocopis* and *Spodiopogon* also occur in the same list. The new names with their synonyms are given below. They will be included in "Index Kewensis, Suppl. IX."

Apocopis himalayensis: *Andropogon himalayensis* Steud.
Batratherum lancifolium; *Andropogon lancifolius* Trin.
B. submuticum: *Andropogon submuticus* Steud.
Chrysopogon coeruleus: *Andropogon coeruleus* Steud.
C. echinulatus: *Andropogon echinulatus* Steud.
C. glaucopsis: *Andropogon glaucopsis* Steud.
C. parvispica: *Andropogon parvispica* Steud.
C. Royleanus: *Andropogon Royleanus* Steud.
C. subrepens: *Andropogon subrepens* Steud.
C. Trinii: *Andropogon Trinii* Steud.
C. villosulus: *Andropogon villosulus* Steud.
Cymbopogon distans: *Andropogon distans* Nees ex Steud.
C. flexuosus: *Andropogon flexuosus* Nees ex Steud.
C. Martini: *Andropogon Martini* Roxb.
C. pachnodes: *Andropogon pachnodes* Trin.
C. pendulus: *Andropogon pendulus* Nees ex Steud.

C. versicolor : *Andropogon versicolor* Nees ex Steud.
Ischaemum corollatum : *Andropogon corollatus* Steud.
I. speciosum : *Andropogon speciosus* Steud.
Spodiopogon involutus : *Andropogon involutus* Steud.

T. A. S. & C. E. C. F.

Early Introduction of Sisal to East Africa.—The first introduction of sisal to East Africa is recorded as having taken place in 1893 when the Deutsche Ostafrikanische Gessellschaft in East Usambara imported 1000 bulbils from Florida on the recommendation of Dr. Hindorf. These bulbils arrived in poor condition and less than 100 were found to have survived the journey. They were carefully tended in the plantation at Kikogwe and new plants were propagated from them. (*K.B.* 1908, 300.)

It has been generally believed that all the sisal plants cultivated in East Africa originated from this particular consignment. This belief is to be found expressed in various publications relating to sisal in East Africa, but it would appear that it may be incorrect and that other early introductions of sisal bulbils to East Africa were subsequently made. In a communication recently received by Mr. William Nowell, Director of the East African Research Station at Amani, from Mr. Johann Franz, Managing Director of Amboni Estates Ltd., Mr. Franz states that some 5000 sisal bulbils were intoduced independently by him in 1900 or 1901 for the Westdeutsche Handels und Plantagen Gessellschaft, who were then owners of the Amboni Estate. Regarding these bulbils Mr. Franz states—"All these bulbils arrived in good condition and were planted in Amboni in order to substitute the Mauritius Agave* which was then cultivated (with success) on Amboni Estate. I purchased these bulbils personally (together with the General Manager of the Estates of the said Company) from the "Horticole Coloniale" in Bruxelles and, as far as I am informed, they received them from some of the Bahama Islands, but this I cannot warrant, nor can I trace the botanical name under which they have been invoiced to us, because all papers, invoices, etc., relating to that period have in the meantime been destoyed in Tanga through War actions, and in Düsseldorf because they had become useless."

It would be of interest if more light could be thrown on the origin of the bulbils that Mr. Franz states were procured from the "Horticole Coloniale" in Brussels in 1900 or 1901. Unfortunately, this establishment has been for many years defunct. F. N. H.

The Botanical Society of South Africa.—In the Annual Report for 1933 of this Society, which has just been issued, it is recorded that the Constitution has been altered so that general recognition and support can be given, not only to the National Botanic Gardens at Kirstenbosch, but also to the Karoo Garden,

*Mauritius Hemp (*Furcraea gigantea* Vent.) probably intended.

Whitehill, and to any other garden that may be established by the Trustees of the National Botanic Gardens. This should provide a stimulus to the development of the Karoo Garden and encourage the establishment of similar gardens in other parts of the Union.

We regret to learn of the deaths of Sir Drummond Chaplin, C.B.E., K.C.M.G., and Sir Lionel Phillips, Bart., both of whom were Vice-Presidents of the Society and had done much good work for the flora of the Union.

Flora of the Clyde Area.*—This handy little volume will be warmly welcomed by naturalists in the Clyde district. Particularly so as it is a self-contained work, provided with keys to families, genera and species, and short, well composed descriptions of each, and not a mere list of species like many British county and district Floras.

In another respect this book differs in a marked degree from any British Flora previously published in that it has broken away from the two main systems of classification in general use. In regard to this question Professor J. R. Matthews writes in his review in the "Journal of Botany," July 1933, p. 203 :—

"The general arrangement of the Flora shows a noteworthy departure from that of previous British Floras. The author has been impressed with the need for showing the student some sort of phyletic sequence in the arrangement of families, and has made a praiseworthy attempt to meet this requirement. While it is obviously impossible to illustrate fully plant relationships in any linear sequence, the system which is here adopted brings the classification of families more into line with modern ideas. The "Apetalae" as a separate group disappears, and the families formerly placed therein are distributed through the Archichlamydeae according to their possible affinities. The arrangement is, in fact, a compromise between the system of De Candolle and the scheme suggested by Hutchinson. It may be argued that the main purpose of a Flora, particularly one which is concerned only with a restricted area, is to afford a ready means of identification, yet the reviewer feels that no opportunity should be lost in bringing before the student the evolutionary concepts that underlie modern taxonomy. In this respect Mr. Lee's handbook is a step in the right direction. With regard to terminology the author might have adopted 'Family,' now generally used, in place of 'Natural Order'."

As the author of the system mentioned, I regret that Mr. Lee has not followed it in its entirety. Instead he has mixed it up rather badly with that of De Candolle (Bentham & Hooker) and Engler & Prantl, in order as he says "to avoid too sudden a departure from the familiar." Here the scientific and the popular are as usual at war one with the other, and a compromise between the two is rarely satisfactory. The result is that in some of the

*By John R. Lee. John Smith & Son (Glasgow) Ltd., 1933. Pp. xvi + 391. Price 7*s.* 6*d.* net.

groups the families are arranged quite contrary to the general principles upon which the system is based. For example Mr. Lee states (p. x) that in his arrangement the *Euphorbiaceae* follow the *Geraniales* and are followed in turn by the *Urticales* and *Amentales*, which immediately precede the perigynous *Rosales*. Unfortunately the student of the British flora only cannot judge as to the most suitable position for the *Euphorbiaceae*. But an examination of the world species would probably soon convince him that the family is heterogenous and that no part of it had anything particularly in common with the *Geraniaceae*. Again the *Malvales* and *Geraniales*, although rather superficially similar, are not really related, but the result of parallel development. The *Geraniales* as shown in this book may well puzzle the student of phylogeny. A group which contains a flax plant, Geranium, maple, horse-chestnut, and a holly is evidently held together by a very slender thread. In addition the *Leguminosae* are placed in front of the *Rosaceae*, whence most botanists are agreed they have been derived.

The book is very clearly printed and the different types used to the best advantage. But the space saved by the abbreviations seems to be rather wasted by the indention of the descriptions instead of the first line of each. A reversal of this arrangement would have brought it into line with general practice and reduced the number of abbreviations to a minimum. J. H.

Report of the Botanical Society and Exchange Club of the British Isles for 1932.—This report is the first edited by the new Secretary, Mr. W. H. Pearsall. In format and in certain familiar features of the contents it is similar to the reports issued by the late Dr. G. C. Druce. It consists of 457 pages (including the report edited by the distributor, Dr. W. A. Sledge), with 55 plates, and many useful and interesting papers, and members of the Society and Club may well feel that they " have their money's worth."

Of familiar features, in part with modifications which are decided improvements, may be noted : " Plant Notes," " Notes on Publications," " New Books," etc., " Abstracts of Papers bearing on the Study of the British Flora " (by A. J. Wilmott and J. S. L. Gilmour), " Obituaries," and " New County and Other Records." Thirty-seven pages are taken up by " Corrections and Additions to Previous Reports," by P. M. Hall. Amongst the original papers of special interest may be noted : " The British Species of *Carex* " by the Secretary ; " *Cardamine pratensis* L.," a peculiarly constructed paper by G. E. Scott Elliott ; " *Zannichellia* " by the Secretary ; " *Valeriana officinalis* L. and its Allies in Great Britain " by the late E. Drabble ; " Annals of the B.E.C." by G. & T. J. Foggitt ; "Plant Nomenclature " by T. A. Sprague, a valuable and clearly written account of the rules of botanical nomenclature as amended at Cambridge in 1930 ; the " Adventive Flora of the Port of Bristol " by C. I. Sandwith ; " Revised Nomenclature of *Salix* " by J. Fraser ;

" Some Native Primula Hybrids " by R. Melville ; the " Taxonomy of Plants intermediate between *Medicago sativa* L. and *M. falcata* L. and their History in East Anglia " by J. S. L. Gilmour ; and " Local Floras " by the late G. C. Druce.

Special mention must be made of F. R. Elliston Wright's account of " Alterations in Vegetative Growth due to Environmental Adaptation in Braunton Burrows," partly because of the intrinsic interest of the subject and partly because of the series of habit and habitat photographic plates with which the paper is illustrated. Many of these are both botanically very instructive and excellent examples of photography. It is, however, unfortunate that they are not dated with the month and year. W. B. TURRILL.

Myrrh.—An interesting publication on myrrh,* which illustrates well the importance of this substance in past ages, has recently appeared. In addition to its use in medicine, myrrh has from a remote period entered into the composition of incense. The " kyphi " of the Egyptians, used for fumigating and embalming, is believed to have been made from it. Myrrh of commerce of the present day is produced chiefly in Somaliland, the powdery sorts from the hinterland, known as " ogo," being considered superior to the coastal or " guban " sorts which are more oily. The produce is shipped from Somaliland mostly to Bombay, where it is sorted, the best qualities going to western markets and the lower grades to the Chinese trade. The author devotes the first pages of his dissertation to a discussion on the botanical origin of myrrh, and is familiar with the work of Drake-Brockman in helping to clear up the difficulties that existed regarding the identity of the Somaliland bdelliums. This is followed by a consideration of the chemistry of the product. The most important passages are those dealing with the use of myrrh by the ancient Egyptians and by the Arabs and Greeks. F. N. H.

Forest Trees and Timbers of the British Empire.†—The second part of this series has been written on exactly the same lines as the first, which was noticed in K.B. 1932, 256. The high standard of the work has been maintained, the descriptions and microphotographs of the timbers being especially clear and easy to follow. The species described in this number were selected primarily on account of their commercial importance, although some less known species, which the authors believe may acquire greater commercial value in the future, have also been included. Certain of the most

* " Myrrhe und Stakte," von Dr. Robert O. Steuer. pp. 48. O. Höfels, Wien 1, Walfischgasse 14. 1933. RM. 5.

†Edited by L. Chalk and J. Burtt Davy, Imperial Forestry Institute, Oxford. II: Twenty West African Timber Trees, by L. Chalk, M.A., D.Phil., J. Burtt Davy, M.A., Ph.D., H. E. Desch, B.Sc., M.A., and A. C. Hoyle, B.Sc., M.A. Pp. 1–108, 20 figs., 20 plates. Oxford, at the Clarendon Press, 1933. Price 7*s.* 6*d.* net.

important species, including the mahoganies, have been omitted since they are still under investigation at the Forest Products Research Laboratory, Princes Risborough. Some minor changes of terminology in the wood descriptions have been made in order to incorporate suggestions put forward by the terminology committee of the International Association of Wood Anatomists. Two of the species described, *i.e.*, *Afzelia africana* Smith and *A. bipindensis* Harms, have already been mentioned in part 1 of this series, but their descriptions in part 2 have been considerably amplified.

C. R. M.

The Sutlej Deodar, its Ecology and Timber Production.*— This work is a thesis submitted by the author, Mr. R. Maclagan Gorrie, D.Sc., for the degree of Doctor of Science of Edinburgh University in May, 1930, and it is the outcome of a careful survey of the vegetation of the Himalayan deodar forests within the boundaries of Spiti in the north, the Nari Khorsum Province of Chinese and Western Tibet in the east, Tehri Garwhal State in the south, and the Lower Bashahr Forest Division in British India in the west. Some of the principal trees associated with deodar in this region appear to be silver fir, *Abies pindrow*; blue pine, *Pinus excelsa*; chil pine, *Pinus longifolia*; neoza pine, *Pinus Gerardiana*; spruce, *Picea Smithiana*; several oaks, particularly *Quercus Ilex*, *Q. dilatata*, *Q. semecarpifolia*, and *Q. incana*; and at lower elevations various tropical and subtropical trees such as *Dalbergia Sissoo*, *Cedrela Toona*, *Albizzia Julibrissin*, and *Mallotus philippinensis*. Many kinds of small trees and shrubs are prominent in the several well defined areas, their individual distribution being determined by climate, altitude, aspect and soil conditions. A generally rich ground vegetation of herbaceous species appears to prevail.

In dealing with this subject the author first describes the situation and topography of the region. He then discusses the geology and climatic conditions, and passes to the population and employments of the people, the history of forest development, fire danger, and a general description of the three zones, moist, dry and arid, wherein the forests are distributed. From this he proceeds to detailed descriptions of the three zones, describing the various types of forest occurring in each, with the plant associations found in different sections of each type. In this way the author describes 14 forest types, and afterwards devotes nearly 60 pages to an analysis of the plants, in botanical sequence, found throughout the whole area. Reference is made to 91 families and the index includes 360 genera. A short chapter at the end of the work is devoted to deodar timber production and there are six pages of plates, each page giving two photographs of forest types.

W. D.

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* By R. Maclagan Gorrie, D.Sc., Indian Forest Service. Indian Forest Records (Silviculture Series), vol. xvii, part iv, pp. 1–140, plates 12. Published by the Government of India, Central Publication Branch, Calcutta, 1933. Price 5s. 6d.

An Introduction to Tropical Soils.*—Dr. Vageler, in his preface to the English translation so ably carried out by Dr. Greene, states that the objects of this book are firstly to assist the planter to solve his own problems and secondly to provide a handbook for students of tropical agriculture. These intentions are admirably fulfilled ; those with long experience of the tropics will be able to find numerous examples which recall mistakes made by themselves in the past, and newcomers will be saved from falling into similar errors.

More than half the book is devoted to chapters on soil formation and soil selection which give much practical advice based on personal experience drawn from many parts of the tropics and subtropics. Such subjects as soil erosion and soil improvement by green manuring and other means are also dealt with.

The book fills a real want and should be warmly received by those concerned with all aspects of tropical agriculture. H. C. S.

The Birds of Tropical West Africa.†—The third volume of this work, which has recently appeared, continues the systematic description and deals with the remaining orders except the *Passeriformes* (Perching Birds). There is a useful illustrated key to the orders, sub-orders and families at the beginning, and the description of each bird is followed by notes on field identification, distribution and habits, as in the previous volumes. The book is well illustrated by twelve coloured plates and numerous text figures of a high standard : in addition there is a useful orographic map of Sierra Leone.

Ten Orders are treated :—*Strigiformes* (Owls) ; *Musophagiformes* (Plantain-eaters and Turacos), here removed from their generally accepted position in the following order, *Cuculiformes* (Cuckoos and Coucals), and placed in a separate order restricted to the single Family *Musophagidae* ; *Caprimulgiformes* (Nightjars) ; *Cypseliformes* (Swifts) and *Bucerotiformes* (Hornbills) which are both treated as separate orders, being removed from their previous association with the *Coraciiformes* (Rollers, Hoopoes, Kingfishers and Bee-eaters) ; *Piciformes*, which includes the Woodpeckers, Wrynecks, Barbets and Honey-Guides. At least one of the latter, well named *Indicator indicator*, has been proved to have the habit of leading human beings to the nests of bees, on the larvae and honey of which it feeds almost exclusively : it has an exceedingly tough skin as a protection against bee-stings. The remaining orders dealt with are the *Coliiformes* (Mousebirds), restricted to the single genus *Colius*, the species of which spend much of their time in creeping about, using their bills as

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* By Dr. P. Vageler. Translated by Dr. H. Greene. Macmillan & Co., Ltd., London, 1933. Pp. xvi+240. 13 figs+12 plates. Price 15*s.* net.

†By D. A. Bannerman. The Crown Agents for the Colonies, 4, Millbank, Westminster, 1933, pp. xxxv + 487, full page plates 12, text figs. 144, coloured map. Price 22*s.* 6*d.*

well as their feet for this purpose, and the *Trogoniformes*, represented in West Africa by two genera of Trogons, which are the most difficult of all birds to preserve, owing to their extremely delicate skin and the loose attachment of the plumage.

The previous volumes were noticed in K.B. 1930, 334, and 1932, 416.

The Indian Forester.*—With the issue of a double number for January 1934, this publication enters upon its sixtieth volume. Starting as a quarterly in July 1875, for most of its existence it has been issued monthly and has been a potent factor in the progress of forestry in all its branches in the Indian Empire. Its value beyond the limits of India is testified to by letters published in this issue, received from various parts of the British Empire.

Its scope has not been restricted, however, to forest science, but has embraced many others, and has included important botanical communications. Sport and general natural history have also been a feature, and a leaven of humour has not been forgotten. It is to be hoped that whatever changes in the constitution of the Indian Forest Service may take place its members will see that this periodical shall retain its present high standard.

Botanical Magazine.—The second part of vol. 157 was published on April 3rd and contains the following plant portraits :—

Meconopsis regia G. Taylor (t. 9348), a fine yellow-flowered species from Nepal ; *Campanula propinqua* Fischer & Meyer var. *grandiflora* Milne-Redhead (t. 9349), raised by Lady Rockley from seeds collected by the Hon. R. W. E. Cecil in Iraq and originally described under the name *C. Cecillii* ; *Habenaria splendens* Rendle (t. 9350), from high altitudes in East Africa ; *Jasminum Farreri* Gilmour (t. 9351) a new species, which has been confused in gardens with *J. Giraldii*, raised from seeds collected by Farrer in Upper Burma ; *Lonicera nitida* E. H. Wilson (t. 9352), from Western China ; *Fritillaria recurva* Benth. (t. 9353), a native of dry hillsides in open evergreen woods in Southern Oregon and California ; *Gazania longiscapa* DC. (t. 9354), found along the coastal districts of South Africa from Humansdorp to Natal ; *Notholirion macrophyllum* (D. Don) Boissier (t. 9355), formerly placed under *Lilium* but considered to belong to a distinct genus *Notholirion* by the late Dr. Stapf just before his death, native of the Central Himalaya ; *Tulipa Stapfii* Turrill (t. 9356), a native of Iraq and Persia, newly named in honour of Dr. Stapf who gave it originally the name *T. cuspidata* which had already been used ; *Pelargonium salmoneum* R. A. Dyer (t. 9357), an interesting new species from the vicinity of Port Elizabeth, South Africa, and *Rhododendron charitopes* Balf. f. et Farrer from Upper Burma and Yunan.

*The Indian Forester, vol. 60, no. 1, January 1934, 106 pages.

Alcide d'Orbigny Commemoration Volume.*—The centenary of Alcide d'Orbigny's celebrated expedition to South America (1826–33) has been marked by the issue of a commemorative work containing essays by various zoologists and one botanist. It begins with a biographical notice of d'Orbigny (pp. 8–13), whose portrait forms the frontispiece, followed by accounts of his work as an entomologist (pp. 15–26), his ideas on the geographical distribution of the marine mollusca of the South American coasts (pp. 27–41), an account of the terrestrial and fluviatile mollusca published in his works (pp. 43–58), and a similar study on the cephalopods (pp. 59–66). An essay on d'Orbigny as an ornithologist (pp. 66–74) is accompanied by a coloured plate of two Bolivian *Trochilidae*, namely, *Oreotrochilus Adela* and *Eriocnemis glaucopoides*. The remaining zoological papers deal with the *Procyonidae* (pp. 81–93) and the affinities of the fossil mammal *Issiodoromys* (pp. 95–108) respectively.

The one botanical paper (pp. 75–79) by R. Benoist, Professor of Botany at the University of Quito during 1930–31, includes taxonomic descriptions of the following new species and varieties of Phanerogams from Ecuador : *Berberis farinosa, B. papillosa, Cardamine ovata* Benth. var. *glabrata, Draba Riveti, Viola scandens* H. B. K. var. *integristipula* and *Naucleopsis chiguila*. The latex of the last species is used by the Colorados Indians as an arrow poison. According to the author, the flora of Ecuador is so rich and varied that it is still possible to discover new species even in the immediate neighbourhood of the capital.

Some Indian Rhodophyceae.—The legend under figure 10, p. 14, in K.B. 1934, should read "*Meristotheca papulosa* (Mont.) J. Ag." instead of *M. japonica* Kylin.

Dr. H. Christ.—The death of Dr. H. Christ took place on November 23rd, 1933, and not during the night of November 16th–17th, as erroneously stated in K.B. 1934, 40.

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*Commémoration du voyage d'Alcide d'Orbigny en Amérique de Sud 1826–1833. Publications du Museum National d'Histoire Naturelle no. 3. Paris. Masson et Cie. 1933, pp. 108, portrait, 1 col. pl. of birds, figs. 15. Price 20 francs.

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